

Data Evaluation Record on the photolysis of saflufenacil (BAS 800 H) in water

PMRA Document Number 1731028

EPA MRID Number 47699901

PMRA Submission Number 2008-0431

Data Requirement: PMRA Data Code: 8.2.3.3.2
EPA DP Barcode: 349858
OECD Data Point: IIA 2.9.2
EPA Guideline: 835.2240

Test material:

Common name: Saflufenacil.

Chemical name:

IUPAC name: N'-{2-Chloro-4-fluoro-5-[1,2,3,6-tetrahydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)pyrimidin-1-yl]benzoyl}-N-isopropyl-N-methylsulfamide.
N'-[2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)benzoyl]-N-isopropyl-N-methylsulfamide.

CAS name: 2-Chloro-5-[3,6-dihydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)-1(2H)-pyrimidinyl]-4-fluoro-N-[[methyl(1-methylethyl)amino]sulfonyl]benzamide.

CAS No.: 372137-35-4.

Synonyms BAS 800 H, CL No. 433379, 4054449, AC 433,379.

Smiles string: N1(C)C(C(F)(F)F)=CC(=O)N(C2=CC(C(=O)NS(=O)(=O)N(C)C(C)C)=C(Cl)C=C2F)C1=O (EPI Suite v3.12 SMILES string from ISIS .MOL).

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USEPA

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Company Code: BAZ

Active Code: SFF

Use Site Category: 13 and 14

EPA PC Code: 118203

CITATION: Ta, C., and J. Trollinger. 2009. Aqueous photolysis of 14C-BAS 800 H. Unpublished study performed, sponsored, and submitted by BASF Corporation, Research Triangle Park, North Carolina. BASF Study Protocol ID No.: 132683. BASF Doc. ID No.: 2009/7000140. Experiment started March 22, 2005 and completed April 26, 2007 (p. 11). Amended final report issued February 9, 2009. (MRID 47699901, PMRA-1731028).

Ta, C., and J. Trollinger. 2007. Aqueous photolysis of 14C-BAS 800 H. Unpublished study performed, sponsored, and submitted by BASF Corporation, Research Triangle Park, North Carolina. BASF Study Protocol ID No.: 132683. BASF Doc. ID No.: 2007/7009413. Experiment started



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PMRA Submission Number {.....}

EPA MRID Number 47127824

Data Requirement: PMRA Data Code:
EPA DP Barcode: D349858
OECD Data Point:
EPA Guideline: 835.2240

Test material:

Common name: Saflufenacil.

Chemical name:

IUPAC name: N'-(2-Chloro-4-fluoro-5-[1,2,3,6-tetrahydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)pyrimidin-1-yl]benzoyl)-N-isopropyl-N-methylsulfamide.

N'-(2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)benzoyl)-N-isopropyl-N-methylsulfamide.

CAS name: 2-Chloro-5-[3,6-dihydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)-1(2H)-pyrimidinyl]-4-fluoro-N-[[methyl(1-methylethyl)amino]sulfonyl]benzamide.

CAS No.: 372137-35-4.

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EPA PC Code: 118203

CITATION: Ta, C., and J. Trollinger. 2007. Aqueous photolysis of 14C-BAS 800 H. Unpublished study performed, sponsored, and submitted by BASF Corporation, Research Triangle Park, North Carolina. BASF Study Protocol ID No.: 132683. BASF Doc. ID No.: 2007/7009413. Experiment started March 22, 2005 and completed April 26, 2007 (p. 10). Final report issued November 9, 2007.

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March 22, 2005 and completed April 26, 2007 (p. 10). Final report issued November 9, 2007. (MRID 47127824, PMRA-1546928).

EXECUTIVE SUMMARY

The aqueous phototransformation of [phenyl- ^{14}C]- and [uracil-4- ^{14}C]-labeled N' -{2-chloro-4-fluoro-5-[1,2,3,6-tetrahydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)pyrimidin-1-yl]benzoyl}- N -isopropyl- N -methylsulfamide (saflufenacil; radiochemical purities $\geq 99.2\%$), at *ca.* 10 mg a.i./kg, was studied in a sterile pH 5 (0.01M acetate) buffer solution that was continuously irradiated using a xenon arc lamp at $22 \pm 1^\circ\text{C}$ for up to 20 days. The light intensity of the xenon arc lamp over the wavelength range 300-800 nm was $592\text{--}622 \text{ W/m}^2$, compared to 584 W/m^2 for natural spring sunlight at 40°N latitude. The intensity of the artificial light was confirmed photochemically using a PNAP/pyridine actinometer. The experiment was conducted in accordance with USEPA Pesticide Assessment Guidelines, Subdivision N §161-2 and in compliance with USEPA GLP Regulations (40 CFR 160). The irradiated test system consisted of glass cylinders (dimensions not specified) containing treated test solution (*ca.* 200 mL) that were sealed with quartz glass discs, placed in wells in a metallic temperature-controlled block within the irradiation apparatus, and attached to individual volatile traps via air inlet/outlet ports. Humidified, filter-sterilized ($0.20 \mu\text{m}$), CO_2 -free air was pulled through a sample vessel and then through a 2N NaOH trapping solution; there was apparently no trap dedicated to organic [^{14}C]volatiles. For the dark controls, the test system consisted of LSC vials (not further described) containing treated test solution (*ca.* 15 mL) that were sealed and stored in the dark in a temperature-controlled incubator; volatiles were not addressed. For both the irradiated and dark control solutions, two vessels were prepared for the phenyl label and two for the uracil label. Each test solution was subsampled (volume not specified) at 0, 2, 7, 10, 15, and 20 days. Samples were analyzed directly, without concentration or purification. Total [^{14}C]residues in the test and trapping solutions were quantified using LSC. Individual [^{14}C]residues were separated and quantified using HPLC. [^{14}C]Residues were identified by comparison to the retention time of reference standards or of [^{14}C]compounds identified using LC/MS and NMR.

Buffer solutions: The temperature and pH of the buffer solutions were reported to be maintained as described in the study protocol; the test solutions were determined to be sterile. No supporting data were provided.

In the solutions treated with the **phenyl label**, overall recoveries of [^{14}C]residues averaged $98.79 \pm 4.01\%$ of the applied (range 89.44-102.76%) from the irradiated samples and $101.17 \pm 1.28\%$ (range 99.65-103.31%) from the corresponding dark control. In the solutions treated with the **uracil label**, overall recoveries of [^{14}C]residues averaged $98.33 \pm 2.68\%$ of the applied (range 92.99-101.72%) from the irradiated samples and $99.74 \pm 1.22\%$ (range 96.82-101.72%) from the corresponding dark control. Recoveries from the irradiated samples decreased slightly ($<6\%$) during the 20-day study. There was no pattern of loss of material over time from the dark controls.

Based on first order linear regression analysis (Excel 2003) and using all data points, saflufenacil (combined labels) dissipated with a half-life of 28.0 days in the irradiated pH 5 buffer. It was stable in the dark control. Since saflufenacil was stable in the dark control, the phototransformation half-

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life is equivalent to the half-life observed in the irradiated samples. The **phototransformation half-life** in pH 5 buffer is 28.0 days based on the continuous irradiation used in the study and 55.9 days based on a 12-hour light/12-hour dark cycle. Since the intensity of the artificial light (592-622 W/m²) is roughly equivalent to natural sunlight (584 W/m²), the **environmental phototransformation half-life** of saflufenacil is *ca. 56 days*.

In the irradiated solutions, no major transformation products were isolated. Seven minor transformation products were tentatively identified using HPLC retention times in the irradiated solution:

- M800H29 (~4.9 minutes; trifluoroacetic acid);
- M800H33 (~7.4 minutes; 1,1,1-trifluoroacetone);
- M800H25 (~14.9 minutes; 2-chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)benzamide);
- M800H07 (~17.4 minutes; N'-[4-chloro-2-fluoro-5-[(isopropyl(methyl)amino)sulfonyl]amino]carbonyl]phenyl]amino)carbonyl]phenyl]-N'-methylurea);
- M800H15 (~18.8 minutes; N-{4-chloro-2-fluoro-5-[(isopropyl(methyl)amino)sulfonyl]amino)-carbonyl]phenyl}-4-4-4-trifluoro-3,3-dihydroxybutanamide);
- a hydroxyl methyl degrade (~18.1 minutes; 2-chloro-5[4-difluoro(hydroxyl)methyl]-(3-methyl-2,6-dioxo-3,6-dihydropyrimidin-1(2H)-yl)-N-{[isopropyl(methyl)amino]sulfonyl}benzamide); and
- M800H04 (~21.7 minutes; structure but no chemical name provided).

In the buffer dark controls, no major or minor transformation products were isolated.

Phenyl label: In the irradiated solution, [phenyl-U-¹⁴C]saflufenacil decreased from an average 99.95% of the applied at time 0 to 67.18% at 20 days posttreatment (study termination). No major transformation products were isolated. Minor transformation product M800H07 was a maximum of 8.55% of the applied at study termination. Minor transformation products M800H25, the hydroxyl methyl degradate, M800H15, and M800H04 each were ≤5.30% of the applied at all sampling intervals. Five other discrete HPLC peaks were each <5% of the applied. At study termination, ¹⁴CO₂ (NaOH solution) totaled up to 1.78% of the applied.

In the corresponding dark control, [¹⁴C]saflufenacil was stable, ranging from an average 99.90-102.06% throughout the study. No major or minor transformation products were isolated.

Uracil label: In the irradiated solution, [uracil-4-¹⁴C]saflufenacil decreased from an average 100.86% of the applied at time 0 to 60.71% at 20 days posttreatment. No major transformation products were isolated. Minor transformation product Unknown 7 was a maximum of 7.06% of the applied at study termination. Minor transformation products M800H29, M800H33, M800H25, the hydroxyl methyl degradate, M800H15, and M800H04 each were ≤4.39% of the applied at all sampling intervals. Five other discrete HPLC peaks were each ≤5.15% of the applied. At study termination, ¹⁴CO₂ (NaOH solution) totaled up to 2.07% of the applied.

In the corresponding dark control, [uracil-4-¹⁴C]saflufenacil was stable, ranging from 98.23-100.86% throughout the study. No major or minor transformation products were isolated.

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The reaction quantum yield for saflufenacil was determined to be 1.4×10^{-3} mol/Einstein.

Natural pond water: In a supplementary experiment, photolysis was studied in natural pond water (pH 7.1) from Minnesota. The test system was similar to that used in the experiment using buffer solution; aliquots of the natural water and corresponding dark controls were collected from duplicate vessels at 0, 1, 2, 4, 7, 10, 15 and 21 days. Samples were analyzed by LSC and HPLC. At the completion of the experiment, the remaining irradiated solutions were combined, lyophilized, and dissolved in acetonitrile, water and methanol. Aliquots were analyzed by LSC and HPLC, and were used to identify individual [^{14}C]compounds by LC/MS and NMR.

Based on first order linear regression analysis (Excel 2003) and using all data points, saflufenacil (combined labels) dissipated with half-lives of 8.71 days in the irradiated solution and 44.6 days in the dark controls. The half-life value for the dark control is relatively uncertain since it is extrapolated beyond the duration of the study. The **phototransformation half-life** of saflufenacil is 10.8 days in natural water based on continuous irradiation used in the study and 21.7 days based on a 12-hour light/12-hour dark cycle. The intensity of the artificial light ($627\text{-}634 \text{ W/m}^2$) was *ca.* 1.1x that of natural sunlight (584 W/m^2). Therefore the **environmental phototransformation half-life** of saflufenacil is *ca.* 22 days.

In the irradiated natural water solutions treated with [phenyl- $\text{U-}^{14}\text{C}$]saflufenacil, one major degradate was isolated but not identified (Table 16, pp. 43-44). Unknown 3 was up to 9.52% of the applied at study termination and increasing in concentration. Minor transformation product M800H07 was a maximum of 9.49% of the applied at 15 days posttreatment and did not appear to increase afterward. Minor transformation products M800H25, the hydroxyl methyl degradate, M800H15, and M800H04 each were $\leq 4.51\%$ of the applied at all sampling intervals. Thirteen other discrete HPLC peaks were each $\leq 7.17\%$ of the applied. At study termination, $^{14}\text{CO}_2$ (NaOH solution) totaled up to 1.68% of the applied.

In the corresponding dark controls, major transformation product M800H07 was 13.32% of the applied at study termination and increasing (Table 15, p. 42). Minor transformation products M800H15 and M800H04 were $\leq 3.27\%$ of the applied at all sampling intervals. Two other discrete HPLC peaks were each $\leq 1\%$ of the applied.

In the irradiated natural water solutions treated with [uracil-4- ^{14}C]saflufenacil, M800H29 and M800H33 were the major transformation products (Table 18, p. 46). M800H29 was a maximum of 29.05% of the applied at 21 days (study termination). M800H33 was a maximum of 19.66% of the applied at 15 days, and was 16.93% at study termination. Minor transformation products M800H25, the hydroxyl methyl degradate, M800H15, and M800H04 each were $\leq 5.37\%$ of the applied at all sampling intervals. Nine other discrete HPLC peaks were each $\leq 4.92\%$ of the applied. At study termination, $^{14}\text{CO}_2$ (NaOH solution) totaled up to 3.00% of the applied.

In the corresponding dark controls, major transformation product M800H33 was a maximum of 30.31% at 21 days (study termination; Table 17, p. 45). Minor transformation products M800H15 and M800H04 were $\leq 8.47\%$ of the applied at all sampling intervals. Three other discrete HPLC peaks were each $\leq 1.36\%$ of the applied.

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A transformation pathway for saflufenacil was proposed by the study author. Saflufenacil degrades by the opening of the uracil ring followed by cleavage of the ring to form M800H04, M800H15, M800H07, trifluoroacetone, and trifluoroacetic acid. The hydroxylation of the trifluoromethyl group and the cleavage of the sulfonylurea side chain result in other minor degradation products. Residues are ultimately mineralized to CO₂. The reviewing authorities note that this pathway is too general and that the importance of pathways between the pH 5 and pH 7 systems is likely different.

Results Synopsis

Combined Labels	Half-life (days)	Transformation products (identified)	
		Major	Minor
pH 5 Sterile Buffer			
Irradiated (light intensity: 592-622 W/m ²)	28.0	(none)	M800H04 (chemical name not provided). M800H07 (N'-[4-chloro-2-fluoro-5- [[{[isopropyl(methyl)amino]sulfonyl}-amino]carbonyl]phenyl]- N'-methylurea). M800H15 (N-{4-chloro-2-fluoro-5- [[{[isopropyl(methyl)amino]sulfonyl}-amino]carbonyl]phenyl}-4- 4-4-trifluoro-3,3-dihydroxybutanamide). M800H25 (2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4- (trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)benzamide). M800H29 (trifluoroacetic acid). M800H33 (1,1,1-trifluoroacetone). Hydroxyl methyl degrade (chemical name not provided). CO ₂ .
Dark	Stable.		
Experimental	28.0 days		
Environmental	56 days		
pH 7 Natural Pond Water			
Irradiated (light intensity: 627-634 W/m ²)	8.71	M800H29 M800H33 Unknown 3 (Rt. ~3.9 min).	M800H04 (chemical name not provided). M800H07 (N'-[4-chloro-2-fluoro-5- [[{[isopropyl(methyl)amino]sulfonyl}-amino]carbonyl]phenyl]- N'-methylurea).
Dark	44.6	M800H07 M800H33	M800H15 (N-{4-chloro-2-fluoro-5- [[{[isopropyl(methyl)amino]sulfonyl}-amino]carbonyl]phenyl}-4- 4-4-trifluoro-3,3-dihydroxybutanamide). M800H25 (2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4- (trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)benzamide). Hydroxyl methyl degrade (chemical name not provided). CO ₂ .
Experimental	10.8 days		
Environmental	22 days		

Study Acceptability: This study is classified as **acceptable/fully reliable**. No deviations from good scientific practices were noted.

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I. MATERIALS AND METHODS

GUIDELINE FOLLOWED: This study was conducted in accordance with USEPA Pesticide Assessment Guidelines, Subdivision N, Environmental Fate, Section 161-2 (1993) and Commission Guideline 94/37/EG (1994; pp. 11-12). One significant deviation from the objectives of subdivision N guidelines was noted:

Limits of detection and quantitation were not reported.

COMPLIANCE: This study was conducted in compliance with USEPA FIFRA GLP (40 CFR 160; pp. 3, 13). Signed and dated Data Confidentiality and Certification statements were provided (pp. 2, 5). Signed, but not dated GLP and Quality Assurance statements were provided (pp. 3-4).

A. MATERIALS:

1. Test Materials [Phenyl-U-¹⁴C] and [uracil-4-¹⁴C]saflufenacil (pp. 11-12).

Chemical Structure: See DER Attachment 1.

Description: Technical.

[Phenyl-U-¹⁴C]

Purity: Radiochemical purity: ≥99.9% (HPLC; p. 12).
Batch No. 825-1085.
Analytical purity: 100.0%.
Specific activity: 5.54 MBq/mg, 332400 dpm/μg.
Location of the radiolabel: Uniformly labeled on the phenyl ring.

[Uracil-4-¹⁴C]

Purity: Radiochemical purity: ≥99.2% (HPLC; p. 13).
Batch No. 829-1017.
Analytical purity: 99.5%.
Specific activity: 4.26 MBq/mg, 255600 dpm/μg.
Location of the radiolabel: At the 4-C position on the uracil ring.

Storage conditions of test chemicals: The test material was stored refrigerated (p. 13).

Physico-chemical properties of saflufenacil:

Parameter		Value	Comment
Molecular weight (g/Mol)		500.86	
Molecular formula		C ₁₇ H ₁₇ ClF ₄ N ₄ O ₅ S	
Water solubility (mg/L)	pH 4, 20°C:	14 (pH 4, 20°C)	
	pH 5, 20°C:	25 (pH 5, 20°C)	
	pH 7, 20°C:	2100 (pH 7, 20°C)	
	pH 9, 20°C:	Not determined due to degradation.	

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Parameter		Value	Comment
Vapor pressure	20°C:	4.5×10^{-15} Pa	Indicates nonvolatility.
	25°C:	2.0×10^{-14} Pa	
UV Absorption	pH 1, pH 7:	UV/VIS $\lambda_{\text{max}} = 272$ nm	Indicates possible susceptibility to direct photolysis at alkaline pH.
	pH 12:	UV/VIS $\lambda_{\text{max}} = 309$ nm	
pKa		4.41	Indicates neutrality at ambient pH.
K_{ow} log K_{ow}		368 2.56	Indicates low potential to bioconcentrate.
Stability of compound at room temperature		Stable for >2 yrs.	

Data obtained from Genari, 2007 (MRID 47127814); Beery, 2007 (MRID 47127815); Beery, 2006 (MRID 47127817); Vanhook, 2005 (MRID 47127818); Vanhook, 2005a (MRID 47127819); and Kroel, 2005 (MRID 47127821).

2a. Buffer Solution: Buffer solutions were sterilized by filtration, and were prepared with HPLC grade water as follows:

Table 1a: Description of buffer solutions

pH	Type and molarity of buffer	Composition
5	0.01M Acetate	1.36 g of sodium acetate was dissolved in 1 L of HPLC water, and the pH adjusted to pH 5 with glacial acetic acid.

Data obtained from p. 13 in the study report.

2b. Water collection, storage and properties

Table 1b: Description of water collection and storage.

Description		Details
Geographic location		Pond in Wabasha County, Minnesota.
Pesticide use history at the collection site		Not reported.
Collection date		May 2, 2005.
Collection procedures for:	Water:	Not reported.
	Sediment:	Not reported.
Sampling depth for:	Water:	Not reported.
	Sediment:	Not reported.
Storage conditions		In a refrigerator at 5°C.
Storage length		Not reported.
Preparation of water and sediment samples:		Not reported.

Data obtained from p. 14; Table 2, p. 29 in the study report.

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Table 1c: Properties of the water.

Description	Details
Temperature (°C)	Not reported.
pH	7.1
Redox potential (mv)	Not reported.
Oxygen concentration (mg/L)	Not reported.
Dissolved organic carbon (%)	Not reported.
Total dissolved solids	92 ppm.
Hardness (CaCO ₃)	82 mg/L.
Electrical conductivity	0.24 mmhos/cm.
Biomass (mg microbial C/100 g or CFU or other)	Not reported.

Data obtained from Appendix 1, p. 84 in the study report.

3. Details of light source

Table 2: Artificial light source

Property	Details
Nature of light source	Xenon arc lamp (Atlas Suntest CPS Plus unit).
Emission wavelength spectrum	300-800 nm.
Light intensity	592-622 W/m ² (buffer experiment) and 627-634 W/m ² (natural water experiment).
Filters used	Filters removed wavelengths <290 nm.
Relationship to natural sunlight	The spectral energy distribution of the artificial light was comparable to natural sunlight at 40°N latitude in the spring; a graphical comparison was provided in Figures 2-3, pp. 52-23. The light intensity of the xenon lamp over 300-800 nm averaged 592-622 W/m ² and 627-634 W/m ² compared to 584 W/m ² for natural sunlight. The intensity of the artificial light in relationship to natural sunlight was measured using a spectroradiometer and delineated using an actinometer.

Data obtained from pp. 14-15; Figures 2-3, pp. 52-53; Appendix 2, pp. 86-95 of the study report.

B. EXPERIMENTAL CONDITIONS:

1. Preliminary Study: A preliminary experiment was conducted to determine the cooling bath temperature setting needed to maintain test solutions at $22 \pm 1^\circ\text{C}$ (p. 15).

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2. Experimental Conditions

Table 3: Experimental Parameters

Parameters		pH 5 Buffer	Natural Water
Duration of the study		20 days.	21 days.
Test concentrations	Nominal:	ca. 10 ppm.	
	Measured:	Not reported.	
Dark controls used (Yes/No)		Yes.	
Replication	Dark	A single bulk solution was prepared for each label in each experiment, and two aliquots were collected at each sampling interval from each label.	
	Irradiated	A single bulk solution was prepared for each label in each experiment, and two aliquots were collected at each sampling interval from each label.	
Preparation of the test medium:	Volume used/treatment	Not reported.	
	Method of sterilization:	Buffer solutions were sterilized by filtration (0.2 mm). All equipment was sterilized by autoclaving (120°C; 20 min).	
	Co-solvent (name/concentration), if any:	Acetonitrile (0.052% by volume; concentration not reported in study).	
Test apparatus (Type/Material/Volume)		<p>Irradiated: Two experiments were conducted. In both, the test apparatus consisted of two glass vessels equipped with air inlet/outlet ports connected to individual volatile trapping systems. Each vessel containing treated buffer solution (ca. 200 mL) was sealed with a quartz glass disc and placed in a well within a metallic temperature-controlled block inside the Suntest apparatus. The test apparatus is illustrated in Figure 4, p. 54 of the study report.</p> <p>Dark control: The test apparatus consisted of LSC vials containing treated buffer solution (ca. 15 mL) that were capped and maintained in the dark in a temperature-controlled incubator.</p>	
Details of traps for volatile compounds, if any ¹		Influent air was pulled through a pre-filter and then through a 1N sodium hydroxide scrubber. Humidified, CO ₂ -free air was passed through the head space of the test vessel and then through a 2N NaOH (ca. 25 mL) trap; flow rate not reported.	
If no traps were used, is the test system closed/open?		Closed.	
Is there any indication of the test material adsorbing to the walls of the test apparatus?		Not reported, and could not be determined from the data provided.	
Experimental Conditions			
Temperature;		22 ± 1°C; measured in a vessel containing ethylene glycol:water (1:1, v:v) that was placed in the metallic block inside the irradiation apparatus.	
Duration of light/darkness:		Continuous.	
Other details, if any		None.	

Data obtained from pp. 6, 13-16, 21, and Figure 4, p. 54 of the study report.

¹ The specifics of the trapping system were unclear. The study authors state the system consisted of one trap containing 2N NaOH in Section 2.8; three traps, one containing ethylene glycol, one containing 1N NaOH, and one undescribed in Section 5.2; and two traps that were undescribed in Figure 4 (p. 54). In the data tables, data were reported as total volatiles and as being for the NaOH trap; these values were identical.

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3. Supplementary experiments:

Quantum yield. To determine quantum yield, an actinometer consisting of pyridine (pyr) and PNAP solution was prepared (pp. 15). The PNAP/pyr solutions were transferred to sterile glass photolysis vessels and covered with quartz glass caps and maintained under irradiated conditions as described for the buffer and natural water solutions. Aliquots (0.5 mL) were collected at the sampling intervals specified for the buffer and natural water solutions.

4. Sampling:

Table 4: Sampling details

Observations	pH 5 buffer	Natural water
Sampling intervals for the parent/transformation products	0, 2, 7, 10, 15, and 20 days.	0, 1, 2, 4, 7, 10, 15 and 21 days.
Sampling method	Irradiated: For each label, an aliquot (<i>ca.</i> 0.5 mL) of treated buffer was collected from each of two bulk samples (200 mL initial volume/sample) at each sampling interval. Dark control: An aliquot of treated buffer (<i>ca.</i> 0.5 mL/vial) was collected for each label at each sampling interval.	
Method of sampling volatile compounds, if any	In irradiated samples, traps were removed at each sampling interval.	
Sampling intervals/times for: Sterility check pH measurement	At 0, 10, and 20 days. At each sampling interval.	None. None.
Sample storage before analysis, if any	Samples were usually processed and analyzed the same day; if not, they were stored refrigerated for up to 3 days.	
Other observation, if any	None.	

Data obtained from pp. 6, 15-17, 22 in the study report.

C. ANALYTICAL METHODS:

Extraction/clean up/concentration methods: Each sample (3 x 20 μ L) was directly analyzed by LSC and an aliquot (50 μ L) of each sample was analyzed by HPLC to determine quantitative distributions of radioactivity (p. 18).

In order to isolate and identify transformation products, aliquots (50 mL) of the irradiated natural water from each label that remained at the end of the study were lyophilized, dissolved back into acetonitrile (1 mL), vortexed and sonicated. Water (1 mL) and methanol (300 μ L) were added and vortexed. Samples were then analyzed by LSC, LC/MS, HPLC, and NMR.

Volatile residue determination: Aliquots (1 mL) of the NaOH trap solutions were mixed with scintillant (15 mL) and analyzed by LSC (pp. 17-18).

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Total ^{14}C measurement: Three aliquots of each sample (20 μL) were analyzed for total [^{14}C]residues using LSC (p. 18).

Derivatization method, if used: A derivatization method was not employed.

Identification and quantification of parent compound: Aliquots (50 μL) of each sample were analyzed by HPLC method 1 under the following conditions: YMC ODS-AQ (4.6 x 250 mm, 5 μm) column, gradient mobile phase consisting of (A) water with 0.5% formic acid and (B) acetonitrile with 0.5% formic acid [percent A:B, v:v; 0 min, 90:10; 5 min, 90:10; 8 min, 50:50; 30 min, 40:60; 35 min, 10:90; 35.1 min, 90:10; 40 min, 90:10], flow rate 1.0 mL/min, with UV (270 nm) and radioactivity detection (p. 18).

Combined samples were concentrated to a known volume under a stream of nitrogen and analyzed by LC/MS in negative or positive mode, under the following conditions: TSK Super ODS (5 cm x 4.6 mm, 5 μ particle) column, gradient mobile phase consisting of (A) water with or without 0.1% trifluoroacetic acid and (B) acetonitrile with or without 0.1% trifluoroacetic acid [percent A:B, v:v; 0 min, 90:10; 10 min, 30:70; 10.5 min, 90:10; 15 min, 90:10], flow rate 0.5 mL/min (pp. 18-19, 23).

Identification and quantification of transformation products: Transformation products were characterized and identified the same as for the parent, with the addition of NMR for characterization of trifluoroacetic acid (pp. 19, 23).

Trifluoroacetic acid was cochromatographed using HPLC method 2 under the following conditions: Alltech NH_2 (4.6 x 250 mm, 5 μm) column, gradient mobile phase consisting of (A) 0.1M citrate buffer at pH 2.2 and (B) acetonitrile [percent A:B, v:v; 0 min, 0:100; 20 min, 0:100; 50 min, 100: 0; 80 min, 100: 0; 80.1 min, 0:100; 100 min, 0:100], flow rate 1.0 mL/min, with UV (270 nm) and radioactivity detection (p. 19).

Trifluoroacetic acid was characterized using NMR (p. 19; Appendix 3, pp. 97-103).

Samples analyzed by HPLC were cochromatographed with unlabeled reference standards of:

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Compound name	IUPAC name	Reference standard No.	Purity
BAS 800 H (Saflufenacil)	N'-[2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)benzoyl]-N-isopropyl-N-methylsulfamide	4054449	99.9%
M800H01	N-[2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)benzoyl]-N'-isopropylsulfamide	4118561	98.8%
M800H02	N'-[2-Chloro-5-(2,6-dioxo-4-(trifluoromethyl)-3,6-dihydropyrimidin-1(2H)-yl)-4-fluorobenzoyl]-N-isopropyl-N-methylsulfamide	4118416	99.2%
M800H07	N'-[4-Chloro-2-fluoro-5-[[([isopropyl(methyl)amino)sulfonyl]amino)carbonyl]phenyl]-N'-methylurea	4775453	95.4%
M800H08	N'-[2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)tetrahydro-1(2H)-pyrimidinyl)benzoyl]-N-isopropyl-N-methylsulfamide	4773881	97.2%
M800H22	3-[(4-Chloro-2-fluoro-5-[[([isopropyl(methyl)amino)sulfonyl]amino)carbonyl]anilino)carbonyl](methyl)amino]-4,4,4-trifluorobutanoic acid	5216337	94.1%
M800H15	N-{4-Chloro-2-fluoro-5-[[([isopropyl(methyl)amino)sulfonyl]amino)carbonyl]phenyl}-4,4,4-trifluoro-3,3-dihydroxybutanamide	5264357	94.5%

Data obtained from Table 1, p. 28 of the study report.

Detection limits (LOD, LOQ) for the parent: Limits of Detection (LOD) and Quantification (LOQ) were not reported.

Detection limits (LOD, LOQ) for the transformation products: Limits of Detection (LOD) and Quantification (LOQ) were not reported.

II. RESULTS AND DISCUSSION

A. TEST CONDITIONS: During the study, the temperature of the buffer solutions was reported to be maintained at $22 \pm 1^\circ\text{C}$; no supporting data were provided. The pH was checked at each sampling interval; no supporting data were provided. The sterility was reported as verified due to the absence of microbial growth (pp. 15, 17, 22).

B. MASS BALANCE:

pH 5 Buffer experiment:

In the phenyl label, overall recoveries of [^{14}C]residues averaged $98.79 \pm 4.01\%$ of the applied (range 89.44-102.76%) from the irradiated buffer solution, and $101.17 \pm 1.28\%$ of the applied (range 99.65-103.31%) from the corresponding dark control (Tables 3-4, pp. 30-31).

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In the uracil label, overall recoveries of [^{14}C]residues averaged $98.33 \pm 2.68\%$ of the applied (range 92.99-101.72%) from the irradiated buffer solution, and $99.74 \pm 1.22\%$ of the applied (range 96.82-101.72%) from the corresponding dark control (Tables 5-6, pp. 32-33).

Natural water experiment:

In the phenyl label, overall recoveries of [^{14}C]residues averaged $95.27 \pm 7.79\%$ of the applied (range 76.54-102.26%) from the irradiated buffer solution, and $100.04 \pm 0.83\%$ of the applied (range 98.68-101.19%) from the corresponding dark control (Tables 7-8, pp. 34-35).

In the uracil label, overall recoveries of [^{14}C]residues averaged $96.04 \pm 4.66\%$ of the applied (range 82.13-100.74%) from the irradiated buffer solution, and $98.94 \pm 1.92\%$ of the applied (range 95.44-101.91%) from the corresponding dark control (Tables 9-10, pp. 36-37).

Recoveries in the irradiated samples in both experiments were variable, and generally trended downward. There was no pattern of loss of material over time from the dark controls.

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Table 5a: Photolysis of [phenyl-U-¹⁴C]saflufenacil in pH 5 buffer, expressed as percentage of the applied radioactivity (mean \pm s.d., n = 2) and 22°C.

Compound ¹ (t _R ~minutes)		Sampling times (days)					
		0	2	7	10	15	20
Saflufenacil	Irradiated	99.95 \pm 0.08	99.22 \pm 1.11	91.65 \pm 1.23	84.52 \pm 8.86	73.95 \pm 14.74	67.18 \pm 17.82
	Dark	99.95 \pm 0.08	102.06 \pm 1.77	101.84 \pm 0.45	99.90 \pm 0.35	102.00 \pm 1.80	101.28 \pm 1.16
Unk 1 (~3.5)	Irradiated	--	--	--	--	--	--, 3.52
Unk 2 (~3.9)	Irradiated	--	--	--	--	--	--, 1.03
Unk 3 (~13.2)	Irradiated	--	--	--	1.20 \pm 0.49	3.24 \pm 1.45	2.80 \pm 1.56
Unk 4 (~14.2)	Irradiated	--	--	--	--, 1.14	--, 1.67	--, 0.92
Unk 5 (M800H25, ~14.9)	Irradiated	--	--	1.23 \pm 0.06	1.41 \pm 0.31	1.56 \pm 0.88	2.87 \pm 0.04
Unk 6 (M800H07, ~17.4)	Irradiated	--	--	3.25 \pm 1.32	3.38 \pm 1.54	5.69 \pm 2.22	6.85 \pm 2.41
Unk 7 (hydroxyl methyl degradate, ~18.1)	Irradiated	--	2.23 \pm 0.30	4.02 \pm 0.04	4.26 \pm 1.48	3.92 \pm 0.16	2.94 \pm 0.64
Unk 8 (M800H15, ~18.8)	Irradiated	--	--	--	--	--, 0.61	2.10 \pm 0.30
Unk 10 (M800H04, ~21.7)	Irradiated	--	--	--	1.88 \pm 0.41	2.46 \pm 1.24	2.12 \pm 0.67
Unk 11 (~28)	Irradiated	--	--	--	--, 1.39	--, 1.77	2.02 \pm 1.43
CO ₂ (NaOH)	Irradiated	0.0 \pm 0.0	0.01, 0.00	0.89, 0.09	0.52 \pm 0.36	2.74, 0.34	1.12 \pm 0.94
	Dark	Volatiles were not trapped.					
Volatile organics	Irradiated	None reported.					
	Dark	Volatiles were not trapped.					
Total recovery	Irradiated	99.95 \pm 0.08	101.45 \pm 1.41	100.63 \pm 1.68	98.42 \pm 3.81	98.01 \pm 6.72	94.31 \pm 6.88
	Dark	99.95 \pm 0.08	102.06 \pm 1.77	101.84 \pm 0.45	99.90 \pm 0.35	102.00 \pm 1.80	101.28 \pm 1.16

Means and standard deviations calculated by the reviewer using data obtained from Tables 3-4, pp. 30-31 and Tables 11-12, pp. 38-39 of the study report and DER Attachment 2. Transformation products were only detected in the irradiated samples.

¹ With the exception of saflufenacil and M800H07 at ca. 17.4 minutes, all identifications are tentative and based on a comparison of the retention times in the tables to those of compounds discussed in the text (p. 24). With the exception of saflufenacil and M800H07, the study authors described all HPLC peaks as Unknowns.

-- Cells in the original data tables were filled with dashes; presumed to mean not detected.

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Table 5b: Photolysis of [uracil-4-¹⁴C]saflufenacil in pH 5 buffer, expressed as percentage of the applied radioactivity (mean \pm s.d., n = 2) and 22°C.

Compound ¹ (t _R ~minutes)		Sampling times (days)					
		0	2	7	10	15	20
Saflufenacil	Irradiated	100.86 \pm 1.22	95.60 \pm 0.38	89.04 \pm 3.82	76.53 \pm 1.10	64.31 \pm 10.30	60.71 \pm 12.72
	Dark	100.86 \pm 1.22	100.24 \pm 0.37	100.20 \pm 0.06	98.23 \pm 1.99	99.00 \pm 0.10	99.94 \pm 1.23
Unk 1 (Trifluoroacetic acid, ~4.9)	Irradiated	--	--	2.64, --	1.23 \pm 0.67	2.60 \pm 0.19	4.01 \pm 1.05
Unk 2 (~7.4)	Irradiated	--	--	--	1.17, --	--, 2.26	2.52 \pm 0.94
Unk 3 (~8.6)	Irradiated	--	--	--	0.84 \pm 0.20	1.77 \pm 0.21	2.78 \pm 1.65
Unk 4 (~13)	Irradiated	--	--	--	3.66 \pm 2.76	7.12 \pm 2.21	11.19 \pm 4.79
Unk 5 (~13.5)	Irradiated	--	--	--	--, 3.52	1.80 \pm 0.11	
Unk 6 (M800H25, ~14.9)	Irradiated	--	1.42 \pm 0.16	1.73 \pm 0.40	2.23 \pm 0.34	1.94 \pm 0.78	1.56 \pm 0.59
Unk 7 (M800H07, ~17.2)	Irradiated	--	--	3.95 \pm 0.16	4.88 \pm 0.42	6.00 \pm 1.15	6.63 \pm 0.61
Unk 8 (hydroxyl methyl degradate, ~18.1)	Irradiated	--	2.14 \pm 0.03	3.96 \pm 0.61	2.92 \pm 0.59	2.96 \pm 0.14	1.83 \pm 0.24
Unk 9 (M800H15, ~18.8)	Irradiated	--	--	--	--	--	1.10 \pm 0.02
Unk 10 (~20.3)	Irradiated	--	--	--	1.51, --	1.91 \pm 1.10	--
Unk 11 (M800H04, ~21.7)	Irradiated	--	--	--	2.08 \pm 0.54	2.07 \pm 0.12	2.75 \pm 1.86
Unk 12 (~28)	Irradiated	--	--	--	--	1.40, --	--
CO ₂ (NaOH)	Irradiated	0.0 \pm 0.0	0.0 \pm 0.0	0.15, 0.01	0.25, 0.02	0.72, 0.08	2.07, 0.12
	Dark	Volatiles were not trapped.					
Volatile organics	Irradiated	None reported.					
	Dark	Volatiles were not trapped.					
Total recovery	Irradiated	100.86 \pm 1.22	99.16 \pm 0.52	100.08 \pm 1.90	97.59 \pm 0.85	97.52 \pm 4.31	94.80 \pm 2.56
	Dark	100.86 \pm 1.22	100.24 \pm 0.37	100.20 \pm 0.06	98.23 \pm 1.99	99.00 \pm 0.10	99.94 \pm 1.23

Means and standard deviations calculated by the reviewer using data obtained from Tables 5-6, pp. 32-33 and Tables 13-14, pp. 40-41 of the study report and DER Attachment 2. Transformation products were only detected in the irradiated samples. ¹ With the exception of saflufenacil, all identifications are tentative and based on a comparison of the retention times in the tables to those of compounds discussed in the text (p. 24).

-- Cells in the original data tables were filled with dashes; presumed to mean not detected.

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Table 5c: Photolysis of [phenyl-U-¹⁴C]saflufenacil in natural water, expressed as percentage of the applied radioactivity (mean \pm s.d., n = 2) and 22°C.

Compound ¹ t _R ~min		Sampling times (days)							
		0	1	2	4	7	10	15	21
Saflufenacil (~22.8)	Irradiated	101.13 \pm 1.60	97.31 \pm 1.51	94.60 \pm 0.85	87.70 \pm 2.63	78.16 \pm 1.91	65.22 \pm 5.14	35.65 \pm 1.28	19.26 \pm 1.05
	Dark	100.91	98.20	97.54	98.88	94.40	92.73	87.79	83.35
Unk 1 (~3.4)	Irradiated	--	--	--	--	--, 0.39	0.82 \pm 0.08	2.76 \pm 0.52	6.99 \pm 0.26
Unk 2 (~3.7)	Irradiated	--	--	--	--	--	--	--	1.73 \pm 0.32
Unk 3 (~3.9)	Irradiated	--	--	--	--	--, 0.85	1.20 \pm 0.18	3.50 \pm 0.59	9.17 \pm 0.49
Unk 4 (M800H29, ~4.1-4.8)	Irradiated	--	--	--	--	--	--	--	2.11 \pm 0.57
Unk 5 (~5.3-5.9)	Irradiated	--	--	--	--	--	--	1.84, --	1.58 \pm 1.27
Unk 6 (~12.0-12.4)	Irradiated	--	--	--	--	0.70 \pm 0.19	1.02, --	1.47 \pm 0.19	2.51 \pm 0.42
Unk 7 (~12.5-12.9)	Irradiated	--	--	--	--	--	--	--, 2.17	1.99 \pm 0.20
Unk 8 (~13.0-13.9)	Irradiated	--	--	--	--	0.67 \pm 0.42	0.94, --	1.74 \pm 0.01	1.13 \pm 0.18
Unk 9 (~14-14.5)	Irradiated	--	--	--	0.98 \pm 0.35	1.24 \pm 0.29	1.16 \pm 0.30	1.27 \pm 0.11	1.65 \pm 0.06
Unk 10 (M800H25, ~14.7-14.9)	Irradiated	--	0.68 \pm 0.14	0.85 \pm 0.16	1.26 \pm 0.24	1.29 \pm 0.05	1.02 \pm 0.03	1.48 \pm 0.27	0.93 \pm 0.38
Unk 1 (~14.7)	Dark	--	0.50	0.93	0.49	0.49	0.58	0.54	--
M800H07, ~15.4-15.9	Irradiated	--	--, 0.72	1.26 \pm 0.24	3.00 \pm 0.05	5.82 \pm 0.77	7.81 \pm 0.73	9.19 \pm 0.43	8.78 \pm 0.77
M800H07 (~15.7)	Dark	--	0.49	0.87	0.91	2.71	5.06	8.43	13.32
Unk 12 (~16.5)	Irradiated	--	--	--	--	--	--	4.07 \pm 0.08	--
Unk 13 (~16.7)	Irradiated	--	0.86 \pm 0.12	1.36 \pm 0.18	2.52 \pm 0.15	3.64 \pm 0.57	5.92 \pm 0.68	3.33 \pm 0.03	4.42 \pm 1.16
Unk 14 (~17.1)	Irradiated	--	--	--	--	--	--	--	2.10 \pm 1.18
Unk 15 (~17.4)	Irradiated	--	0.69 \pm 0.21	0.85 \pm 0.01	0.72 \pm 0.35	0.65 \pm 0.03	0.85 \pm 0.54	1.01 \pm 0.21	--, 0.68
Unk 4 (~17.4)	Dark	--	--	--	--	0.45	1.14	1.84	3.27
Unk 16 (Hydroxy methyl degradate or M800H15, ~18) ²	Irradiated	--	--	--	--	--, 0.61	0.67 \pm 0.18	--, 1.02	--, 0.62
Unk 17 (~19.0-19.4)	Irradiated	--	0.76 \pm 0.13	0.93 \pm 0.22	2.50 \pm 0.42	3.73 \pm 0.23	4.09 \pm 0.14	3.95 \pm 0.79	--, 2.98
Unk 5 (~19)	Dark	--	0.46	--	--	0.35	0.90	1.25	1.26
Unk 18 (~20.0-22)	Irradiated	--	--	--	--	--	--	--	1.99 \pm 1.02
Unk 6 (~20.8)	Dark	--	--	--	--	0.28	--	--	--

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Compound ¹ t _R ~min		Sampling times (days)							
		0	1	2	4	7	10	15	21
Unk 19 (~25.6-26)	Irradiated	--	--	0.52 ± 0.07	1.67 ± 0.71	2.12 ± 0.82	3.45 ± 0.30	2.93 ± 0.12	2.38 ± 0.98
CO ₂	Irradiated	0.0 ± 0.0	0.0 ± 0.0	0.02 ± 0.01	0.08 ± 0.01	0.26 ± 0.03	0.49 ± 0.10	0.91 ± 0.14	1.64 ± 0.06
	Dark	Volatiles were not trapped.							
Volatile organics	Irradiated	Not reported.							
	Dark	Volatiles were not trapped.							
Total recovery	Irradiated	101.13 ± 1.60	100.65 ± 0.40	100.38 ± 0.63	100.40 ± 0.83	99.18 ± 0.21	93.66 ± 2.61	80.67 ± 5.83	86.10 ± 1.79
	Dark	100.91	99.65	99.35	100.28	98.68	100.41	99.84	101.19

Means and standard deviations calculated by the reviewer using data obtained from Tables 7-8, pp. 34-35 and Tables 15-16, pp. 42-44 of the study report and DER Attachment 2.

1 With the exception of saflufenacil and M800H07 (see footnote #2), all identifications are tentative and based on a comparison of the retention times in the tables to those of compounds discussed in the text (p. 24).

2 In the text (p. 24), the study authors state that the peak at 18.1 minutes is the hydroxyl methyl degradate. In Figure 26 (p. 80), this peak corresponds to M800H15 (retention time *ca.* 18.9 minutes according to the text).

-- Cells in the original data tables were filled with dashes; presumed to mean not detected.

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Table 5d: Photolysis of [uracil-4-¹⁴C]saflufenacil in natural water, expressed as percentage of the applied radioactivity (mean \pm s.d., n = 2) and 22°C.

Compound ¹ t _R -min		Sampling times (days)							
		0	1	2	4	7	10	15	21
Saflufenacil	Irradiated	100.01 \pm 0.01	95.34 \pm 1.42	91.06 \pm 1.91	87.81 \pm 0.24	74.14 \pm 2.66	58.15 \pm 3.03	34.55 \pm 8.82	18.52 \pm 7.23
	Dark	101.44 \pm 0.59	99.76 \pm 2.16	97.81 \pm 2.47	96.92 \pm 2.17	94.52 \pm 3.44	88.42 \pm 6.42	80.76 \pm 16.33	69.66 \pm 29.03
Unk 1 (~3.4)	Irradiated	--	--	--	--	--	--	1.10 \pm 0.20	1.00 \pm 0.20
Unk 2 (~3.9)	Irradiated	--	--	--	--	--	--	1.53 \pm 0.70	2.38 \pm 0.62
M800H29 (~4.8)	Irradiated	--	--	1.15 \pm 0.06	2.66 \pm 0.76	5.80 \pm 1.75	11.18 \pm 0.91	22.43 \pm 3.69	28.92 \pm 0.19
M800H33 (~6.7-6.8)	Irradiated	--	--	0.51 \pm 0.16	1.83 \pm 0.19	3.74 \pm 0.06	6.94 \pm 2.11	13.55 \pm 8.64	13.25 \pm 5.21
	Dark	--	--	--	1.13 \pm 0.51	2.93 \pm 0.93	5.35 \pm 3.95	18.33, 3.15	30.31, 5.44
Unk 5 (~7.7)	Irradiated	--	--	--	0.80 \pm 0.16	1.73 \pm 0.44	2.55 \pm 0.62	3.17 \pm 1.19	2.95 \pm 1.39
Unk 6 (~12.8)	Irradiated	--	--	--	0.64, --	1.34 \pm 1.05	1.20 \pm 0.14	3.18 \pm 0.20	2.48 \pm 0.20
Unk 7 (~13.2)	Irradiated	--	--	--	--	--	--, 0.32	1.54 \pm 0.10	0.89 \pm 0.50
Unk 2 (~13.4)	Dark	--	--	--	--	--	--	0.88, --	1.14 \pm 0.25
Unk 8 (M800H25, ~14.7)	Irradiated	--	1.00 \pm 0.00	1.07 \pm 0.28	1.22 \pm 0.07	1.48 \pm 0.21	1.46 \pm 0.15	1.14 \pm 0.80	1.47 \pm 0.30
Unk 3 (M800H25, ~14.7)	Dark	--	0.61 \pm 0.02	0.71 \pm 0.00	0.74 \pm 0.14	0.71 \pm 0.08	0.63 \pm 0.02	--, 0.61	--, 0.67
Unk 9 (~15.4)	Irradiated	--	--	--	--	--	--	--	--, 1.67
Unk 10 (~16.7)	Irradiated	--	--	1.21 \pm 0.04	1.98 \pm 0.42	2.56 \pm 0.23	2.81 \pm 0.45	--, 4.92	2.11 \pm 0.69
Unk 11 (~17.1)	Irradiated	--	--	--	--	--	--	3.26, --	1.06 \pm 0.10
Unk 12 (M800H07, ~17.4)	Irradiated	--	--	0.62 \pm 0.18	--	0.36, --	--, 0.42	1.11 \pm 0.33	--
Unk 4 (M800H07, ~17.4)	Dark	--	--	--	--	1.41, --	1.65 \pm 1.24	2.92 \pm 2.55	8.47, 1.23
Unk 13 (Hydroxy methyl degradate or M800H15 ² , ~18)	Irradiated	--	--	0.41, --	--	--	--, 0.80	0.88, --	--
Unk 5 (~19)	Dark	--	--	0.89, --	--, 0.67	2.29, --	1.11 \pm 0.73	2.37 \pm 1.85	4.84, --
Unk 14 (~19.5)	Irradiated	--	0.91 \pm 0.64	0.84 \pm 0.06	2.39 \pm 0.48	3.10 \pm 0.77	4.69 \pm 0.96	4.22 \pm 0	2.87 \pm 1.52
Unk 15 (~25.6)	Irradiated	--	--	0.72 \pm 0.13	1.36 \pm 0.10	2.22 \pm 0.43	2.20 \pm 0.25	1.42 \pm 0.53	1.08 \pm 0.56
Unk 6 (~30.6)	Dark	--	--	--	--	--	--	--	1.36, --

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Compound ¹ t _R -min		Sampling times (days)							
		0	1	2	4	7	10	15	21
CO ₂	Irradiated	0.00 ± 0.00	0.01 ± 0.00	0.02 ± 0.00	0.10 ± 0.02	0.32 ± 0.23	1.70 ± 0.59	0.71 ± 0.11	2.05 ± 1.34
	Dark	Volatiles were not trapped.							
Volatile organics	Irradiated	Not reported.							
	Dark	Volatiles were not trapped.							
Total recovery	Irradiated	100.01 ± 0.01	97.26 ± 2.06	97.39 ± 1.61	100.45 ± 0.42	96.59 ± 0.83	93.65 ± 2.69	96.57 ± 0.61	86.44 ± 6.10
	Dark	101.44 ± 0.59	100.37 ± 2.18	98.96 ± 1.84	99.12 ± 1.99	100.01 ± 0.02	97.16 ± 0.49	97.52 ± 1.01	96.97 ± 2.16

Means and standard deviations calculated by the reviewer using data obtained from data obtained from Tables 9-10, pp. 36-37 and Tables 17-18, pp. 45-47 of the study report and DER Attachment 2.

1 With the exception of saflufenacil, trifluoroacetic acid, and trifluoroacetone, all identifications are tentative and based on a comparison of the retention times in the tables to those of compounds discussed in the text (p. 24).

2 In the text (p. 24), the study authors state that the peak at 18.1 minutes is the hydroxyl methyl degradate. In Figure 26 (p. 80), this peak corresponds to M800H15 (retention time *ca.* 18.9 minutes according to the text).

-- Cells in the original data tables were filled with dashes; presumed to mean not detected.

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C. TRANSFORMATION OF PARENT COMPOUND:

pH 5 Buffer Experiment:

In the pH 5 buffer, [phenyl-U-¹⁴C]saflufenacil decreased from an average 99.95% of the applied at time 0 to 67.18% at 20 days (study termination; Table 12, p. 39; DER Attachment 2). In the corresponding dark control, [phenyl-U-¹⁴C]saflufenacil was stable, ranging from an average 99.90% to 102.06% of the applied throughout the study (Table 11, p. 38; DER Attachment 2).

In the pH 5 buffer, [uracil-4-¹⁴C]saflufenacil decreased from an average 100.86% of the applied at time 0 to 60.71% at 20 days (study termination; Table 14, p. 41; DER Attachment 2). In the corresponding dark control, [uracil-4-¹⁴C]saflufenacil was relatively stable, ranging from an average 98.23% to 100.86% of the applied throughout the study (Table 13, p. 40; DER Attachment 2).

Natural Water Experiment:

In the natural water, [phenyl-U-¹⁴C]saflufenacil decreased from an average 101.13% of the applied at time 0 to 65.22% at 10 days, and was 19.26% at 21 days (study termination; Table 16, p. 43; DER Attachment 2). In the corresponding dark control, [phenyl-U-¹⁴C]saflufenacil decreased from 100.91% of the applied at time 0 to 83.35% at 21 days (study termination; Table 15, p. 42; DER Attachment 2).

In the natural water, [uracil-4-¹⁴C]saflufenacil decreased from an average 100.01% of the applied at time 0 to 58.15% at 10 days and was 18.52% at 21 days (study termination; Table 18, p. 46; DER Attachment 2). In the corresponding dark control, [uracil-4-¹⁴C]saflufenacil decreased from an average 101.44% of the applied at time 0 to 69.66% at 21 days (study termination; Table 17, p. 45; DER Attachment 2).

HALF-LIFE/DT50/DT90: Based on first-order linear regression analysis (Excel 2003), [phenyl-U-¹⁴C]saflufenacil dissipated from the irradiated pH 5 buffer solutions and natural water with reviewer-calculated half-lives of 31.7 and 8.90 days, respectively (Table 12, p. 39, Table 16, p. 43; DER Attachment 2). In the corresponding dark controls, [phenyl-U-¹⁴C]saflufenacil was stable in the pH 5 buffer, and dissipated from the natural water with a reviewer-calculated half-life of 79.4 days (Table 15, p. 42; DER Attachment 2).

[Uracil-4-¹⁴C]saflufenacil dissipated from the irradiated pH 5 buffer solutions and natural water with reviewer-calculated half-lives of 25.0 and 8.42 days, respectively (Table 14, p. 41, Table 18, p. 46; DER Attachment 2). In the corresponding dark controls, [uracil-4-¹⁴C]saflufenacil was relatively stable in the pH 5 buffer, and dissipated from the natural water with a reviewer-calculated half-life of 36.6 days (Table 17, p. 45; DER Attachment 2).

In the combined labels, saflufenacil dissipated from the irradiated pH 5 buffer, and irradiated and dark natural water solutions with reviewer-calculated half-lives of 28.0 days, 8.71 days, and 44.6 days, respectively. The half-life values greater than 20-21 days are relatively uncertain since they are extrapolated beyond the duration of the study. These values are consistent with the study author-calculated half-life values for the combined labels (p. 26; Table 19, p. 48; Appendix 4, pp. 105-109).

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Half-lives/DT50/DT90

		First order linear			Observed DT50 (days)	Observed DT90 (days)
		Half-life (days) ¹	Regression equation	r ²		
Phenyl label						
pH 5	Irradiated	31.7	y = -0.0218x + 4.6361	0.68	---	---
	Dark	Stable.			---	---
Natural Water	Irradiated	8.90	y = -0.0779x + 4.7447	0.95	10-15	---
	Dark	79.4	y = -0.0087x + 4.6093	0.97	---	---
Uracil label						
pH 5	Irradiated	25.0	y = -0.0277x + 4.6249	0.84	---	---
	Dark	Stable.			---	---
Natural Water	Irradiated	8.54	y = -0.0812x + 4.7239	0.92	10-15	---
	Dark	36.6	y = -0.0189x + 4.6405	0.53	---	---
Combined labels						
pH 5	Irradiated	28.0	y = -0.0248x + 4.6305	0.74	---	---
	Dark	Stable.			---	---
Natural Water	Irradiated	8.71	y = -0.0795x + 4.7343	0.93	---	---
	Dark	44.6	y = -0.0155x + 4.6301	0.49	---	---

¹ Determined by the reviewer using first order linear regression analysis (Excel 2003) and using all data points (DER Attachment 2).

--- = Not observed.

Since saflufenacil was stable in the dark buffer solution controls, the phototransformation half-life is equivalent to the half-life observed in the irradiated samples. The **phototransformation half-life** of saflufenacil in pH 5 buffer (combined labels) is 28.0 days based on continuous irradiation and 55.9 days based on a 12 hour light/12 hour dark cycle.

The **phototransformation half-life** of saflufenacil in natural water (combined labels) determined using the equation $(\ln 2) \div [(\ln 2/\text{dark control half-life}) - (\ln 2/\text{irradiated half-life})]$, is 10.8 days in natural water based on continuous irradiation and 21.7 days based on a 12 hour light/12 hour dark cycle.

The artificial light for pH 5 buffer (592-622 W/m²) and natural light (627-634 W/m²) was approximately equivalent to natural sunlight (584 W/m²); no other numerical comparison was reported (p. 21). Therefore the **environmental phototransformation half-life** of saflufenacil (combined labels) is 56 and 22 days in buffer solution and natural water, respectively.

TRANSFORMATION PRODUCTS: No major transformation products were isolated in the buffer solutions. Two major transformation products were isolated and identified in the natural water:

- M800H33 (1,1,1-trifluoroacetone) and
- M800H29 (trifluoroacetic acid).

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Five other transformation products were identified:

- M800H07 (N'-[4-chloro-2-fluoro-5-[({[isopropyl(methyl)amino]sulfonyl} amino)carbonyl]-phenyl} amino)carbonyl]phenyl} - N'-methylurea),
- M800H25 (2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)benzamide),
- M800H15 (N-{4-chloro-2-fluoro-5-[({[isopropyl(methyl)amino]sulfonyl} amino)-carbonyl]phenyl}-4-4-4-trifluoro-3,3-dihydroxybutanamide),
- M800H04 (chemical name not provided), and
- the hydroxyl methyl degradate (5-chloro-5[4-difluoro(hydroxyl)methyl]-(3-methyl-2,6-dioxo-3,6-dihydropyrimidin-1(2H)-yl-N-{[isopropyl(methyl)amino]sulfonyl} benzamide; pp. 24-25; Figures 14-17, pp. 65-71).

Table 6 provides a crosswalk of retention times and preliminary names (e.g., Unk 1) for the seven identified transformation products of saflufenacil.

Table 6: Retention times (and preliminary names) for the transformation products of saflufenacil.

Product	Label	Buffer (pH 5.0)		Natural water (pH 7.1)	
		Dark	Irradiated	Dark	Irradiated
M800H04	phenyl	nd ^a	21.7 (Unk 10)	19 (Unk 5)	19-19.4 (Unk 17)
	uracil	nd ^a	21.7 (Unk 11)	19 (Unk 5)	19.5 (Unk 14)
M800H07	phenyl	nd ^a	17.4 (Unk 6)	15.7 (Unk 2)	15.4-15.9 (Unk 11)
M800H15	phenyl	nd ^a	18.8 (Unk 8)	17.4 (Unk 4)	17.4 (Unk 15)
	uracil	nd ^a	18.8 (Unk 9)	17.4 (Unk 4)	17.4 (Unk 12)
M800H25	phenyl	nd ^a	14.9 (Unk 5)	nd ^a	13-13.9 (Unk 8)
	uracil	nd ^a	14.9 (Unk 6)	nd ^a	13.2 (Unk 7)
M800H29	uracil	nd ^a	4.9 (Unk 1)	nd ^a	4.8 (Unk 3)
M800H33	uracil	nd ^a	7.4 (Unk 2)	6.8 (Unk 1)	6.7 (Unk 4)
Hydroxyl methyl degrade	phenyl	nd ^a	18.1 (Unk 7)	nd ^a	17.1 (Unk 14)
	uracil	nd ^a	18.1 (Unk 8)	nd ^a	17.1 (Unk 11)

a "nd" means not detected.

pH 5 Buffer Experiment:

In the irradiated buffer solutions treated with [phenyl-U-¹⁴C]saflufenacil, no major transformation products were isolated (Table 12, p. 39). Minor transformation product M800H07 was a maximum of 8.55% of the applied at study termination. Minor transformation products M800H25, the hydroxyl methyl degradate, M800H15, and M800H04 each were ≤5.30% of the applied at all sampling intervals. Five other discrete HPLC peaks were each <5% of the applied. At study termination, ¹⁴CO₂ (NaOH solution) totaled up to 1.78% of the applied.

In the irradiated buffer solutions treated with [uracil-4-¹⁴C]saflufenacil, no major transformation products were isolated (Table 14, p. 41). Minor transformation product Unknown 7 was a maximum

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of 7.06% of the applied at study termination. Minor transformation products M800H29, M800H33, M800H25, the hydroxyl methyl degradate, M800H15, and M800H04 each were $\leq 4.39\%$ of the applied at all sampling intervals. Five other discrete HPLC peaks were each $\leq 5.15\%$ of the applied. At study termination, $^{14}\text{CO}_2$ (NaOH solution) totaled up to 2.07% of the applied.

There were no transformation products in the corresponding dark controls.

Natural Water Experiment:

In the irradiated natural water solutions treated with [phenyl-U- ^{14}C]saflufenacil, one major degradate was isolated but not identified (Table 16, pp. 43-44). Unknown 3 was up to 9.52% of the applied at study termination and increasing in concentration. Minor transformation product M800H07 was a maximum of 9.49% of the applied at 15 days posttreatment and did not appear to increase afterward. Minor transformation products M800H25, the hydroxyl methyl degradate, M800H15, and M800H04 each were $\leq 4.51\%$ of the applied at all sampling intervals. Thirteen other discrete HPLC peaks were each $\leq 7.17\%$ of the applied. At study termination, $^{14}\text{CO}_2$ (NaOH solution) totaled up to 1.68% of the applied.

In the corresponding dark controls, major transformation product M800H07 was 13.32% of the applied at study termination and increasing (Table 15, p. 42). Minor transformation products M800H15 and M800H04 were $\leq 3.27\%$ of the applied at all sampling intervals. Two other discrete HPLC peaks were each $\leq 1\%$ of the applied.

In the irradiated natural water solutions treated with [uracil-4- ^{14}C]saflufenacil, M800H29 and M800H33 were the major transformation products (Table 18, p. 46). M800H29 was a maximum of 29.05% of the applied at 21 days (study termination). M800H33 was a maximum of 19.66% of the applied at 15 days, and was 16.93% at study termination. Minor transformation products M800H25, the hydroxyl methyl degradate, M800H15, and M800H04 each were $\leq 5.37\%$ of the applied at all sampling intervals. Nine other discrete HPLC peaks were each $\leq 4.92\%$ of the applied. At study termination, $^{14}\text{CO}_2$ (NaOH solution) totaled up to 3.00% of the applied.

In the corresponding dark controls, major transformation product M800H33 was a maximum of 30.31% at 21 days (study termination; Table 17, p. 45). Minor transformation products M800H15 and M800H04 were $\leq 8.47\%$ of the applied at all sampling intervals. Three other discrete HPLC peaks were each $\leq 1.36\%$ of the applied.

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Table 7: Chemical names and CAS numbers for the transformation products of saflufenacil.

Applicants Code Name	CAS Number	Chemical Name	Chemical Formula	MW (g/mol)	Smiles String
TFA	---	Trifluoroacetic acid	CF ₃ CO ₂ H	114	---
M800H33	421-50-1	1,1,1-Trifluoroacetone	C ₃ H ₃ F ₃ O	112	---
M800H07	---	N'-[4-Chloro-2-fluoro-5-[[[isopropyl-(methyl)amino]sulfonyl]amino]carbonyl]phenyl]-N'-methylurea	C ₁₃ H ₁₈ ClFN ₄ O ₄ S	380.83	---
M800H15	---	N-{4-Chloro-2-fluoro-5-[[[isopropyl-(methyl)amino]sulfonyl]amino]carbonyl]phenyl}-4-4-4-trifluoro-3,3-dihydroxybutanamide	C ₁₅ H ₁₈ ClF ₄ N ₃ O ₆ S	479.84	---
M800H25	---	2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)benzamide	---	---	---
M800H04	---	---	---	518	---
Hydroxyl methyl degrade	---	5-Chloro-5[4-difluoro(hydroxyl)-methyl]-(3-methyl-2,6-dioxo-3,6-dihydropyrimidin-1(2H)-yl-N-[[isopropyl(methyl)amino]-sulfonyl]benzamide	---	---	---

Data obtained from pp. 24-25; Table 1, p. 28; Figure 27, p. 81 of study report and MRID 47127825.

--- Not reported.

VOLATILIZATION: In the irradiated buffer solutions, ¹⁴CO₂ was a maximum of 2.74% of the applied at day 15 in the phenyl label and 2.07% at day 20 in the uracil label. In the natural water, ¹⁴CO₂ was a maximum of 1.68-3.00% of the applied at day 21. Volatiles were not measured in the dark controls.

TRANSFORMATION PATHWAY: A proposed transformation pathway for saflufenacil was described and illustrated (p. 25 and Figure 27, p. 81). Saflufenacil degrades by the opening of the uracil ring followed by cleavage of the ring to form M800H04, M800H15, M800H07, trifluoroacetone, and trifluoroacetic acid. The hydroxylation of trifluoromethyl and the cleavage of the sulfonylurea side chain result in other minor degradation products, and saflufenacil is eventually mineralized to CO₂. The reviewing authorities note that this pathway is too general and that the importance of pathways between the pH 5 and pH 7 systems is likely different.

D. SUPPLEMENTARY EXPERIMENT-RESULTS:

The results of the experiment using natural water are integrated into the discussion of the definitive experiment.

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The reaction quantum yield for saflufenacil was determined to be 1.4×10^{-3} mol/Einstein, based on the half-life of the PNAP, the DT50 of the parent compound in the irradiated system, the UV absorbance profiles of the actinometer and test solutions, and the irradiation energy data provided by the manufacturer of the Atlas Suntest (p. 25; Appendix 5, p. 120).

III. STUDY DEFICIENCIES

1. Based on tentative identifications using retention times, there appears to be one major transformation product in the natural water that was not identified. In the irradiated natural water/phenyl label, a compound with a Rt of *ca.* 3.9 minutes is considered an unknown; this compound was a maximum of 9.52% of the applied at study termination and was increasing in concentration (Table 16, p. 43). However, this deficiency does not affect the acceptability of the study because the study of the natural water system is supplemental to the study of the buffered system.
2. Based on the information provided in the study report, it appears that the study authors used the natural waters to isolate [^{14}C]compounds for further identification (MS, NMR; pp. 17-18). The study authors reported retention times for identified compounds in the text (pp. 23-25). The retention times are presented as a precise value rather than a range; the study authors mentioned that there were shifts in retention times (p. 23). It was not stated whether the retention times were consistent between the buffer solution (analyzed directly) and purified compound in carrier (reference standards or those purified from the natural water). The study authors did not, in most cases, relate the identified compounds to the HPLC peaks. In most cases, the study authors report retention times and identify peaks as "Unknown x". Also, "Unknown x" is not consistent between treatments, *i.e.*, the compound identified as Unknown 1 in the buffer/uracil and buffer/phenyl is not the same based on retention times, and in the natural water varies with label and light/dark. Upon request, the registrant provided a cross-walk of retention times for identified compounds that was used in this review (DER Table 7). This deficiency does not affect the acceptability of the study.
3. The specifics of the trapping system were unclear. The study authors state the system consisted of one trap containing 2N NaOH in Section 2.8 (p. 14); three traps, one containing ethylene glycol, one containing 1N NaOH, and one undescribed in Section 5.2 (p. 21); and two traps that were undescribed in Figure 4 (p. 54). Data were reported as total volatiles in the material balance data tables (solution + volatiles = total) and as CO_2 (in the NaOH trap) in the detailed distribution tables. Since the values in the tables were identical, either there was no ethylene glycol trap or no volatile organic [^{14}C]compounds were detected. This deficiency does not affect the acceptability of the study.
4. It could not be determined if the natural water was sterilized prior to use. The study authors do not describe a sterilization process, and procedures to maintain sterility are specific to the pH 5 buffer (p. 16). However, the test systems are described as "...sterile filtered test systems..." in the description of the treatment step (p. 15). The rate of degradation in the dark control natural water (pH 7) was *ca.* 45 days. In a hydrolysis experiment (Panek, 2006; MRID 47127823),

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saflufenacil dissipated with a half-life of 248 days in pH 7 buffer. This deficiency does not affect the acceptability of the study given the photolytic half-lives are adjusted for dark controls.

5. Limits of detection and quantitation were not reported. This deficiency does not affect the acceptability of the study.

IV. REVIEWER'S COMMENTS

1. Only two samples of each treatment were prepared, and these samples were subsampled at each sampling interval.
2. The material balances in the irradiated samples trended downward for both labels (<6%). In the buffer solution, the recoveries decreased from an average 99.95-100.86% at time 0 to 94.31-94.80% at 20 days (Table 4, p. 31 and Table 6, p. 33). In the natural water, the recoveries decreased from an average 100.01-101.13% at time 0 to 86.10-86.44% at 21 days (Table 8, p. 35 and Table 10, p. 37). Adsorption to glassware was not investigated. The study author stated that the loss of material may have been due to untrapped volatiles (p. 22). Subdivision N guidelines require that the material balances be stable at 90-110%.
3. Supporting data were not provided to verify the temperature, pH, or sterility of the test systems.
4. The study authors did not provide the chemical names for M800H04 or the hydroxyl methyl degradate. Structures were provided. It was possible to generate a chemical name for the hydroxyl methyl degradate using a structure-naming program, but M800H04 could not be named using the program.
5. An amended final report (Ta and Trollinger, 2009; MRID 47699901; PMRA-1731028) was submitted to replace the original final report (Ta and Trollinger, 2007; MRID 47127824; PMRA-1546928). The reports are mostly identical, with the following corrections made to the amended report. The quantum yield of BAS 800 H was recalculated (Table 19, p. 49; Appendix 5, pp. 115-124). Phototransformation tables were corrected with new percent of the applied values for the parent compound and almost all degradates (Tables 12, 14-16, 18, pp. 39, 41-44, 46-47). Edits and updates of the study text that reflect these changes, including recalculated half-lives, were made as well.

V. REFERENCES

1. U.S. Environmental Protection Agency. 1982. Pesticide Assessment Guidelines, Subdivision N, Chemistry: Environmental Fate, Section 161-2. Photolysis studies. Office of Pesticide and Toxic Substances, Washington, DC. EPA 540/9-82-021.
2. U.S. Environmental Protection Agency. 1989. FIFRA Accelerated Reregistration, Phase 3 Technical Guidance. Office of the Prevention, Pesticides, and Toxic Substances, Washington, DC. EPA 540/09-90-078.

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3. U.S. Environmental Protection Agency. 1993. Pesticide Registration Rejection Rate Analysis - Environmental Fate. Office of the Prevention, Pesticides, and Toxic Substances, Washington, DC. EPA 738-R-93-010.
4. Panek, M. 2006. Hydrolysis of ^{14}C -BAS 800 H. Unpublished study performed, sponsored, and submitted by BASF Corporation, Research Triangle Park, North Carolina. BASF Reg. Doc. No.: 2005/7004259. BASF Study No.: 132680.

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Attachment 1: Structures of Parent Compound and Transformation Products

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Saflufenacil [BAS 800 H, CL No. 433379, 4054449, AC 433,379]

IUPAC Name: N'-{2-Chloro-4-fluoro-5-[1,2,3,6-tetrahydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)pyrimidin-1-yl]benzoyl}-N-isopropyl-N-methylsulfamide.
N'-[2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)benzoyl]-N-isopropyl-N-methylsulfamide.

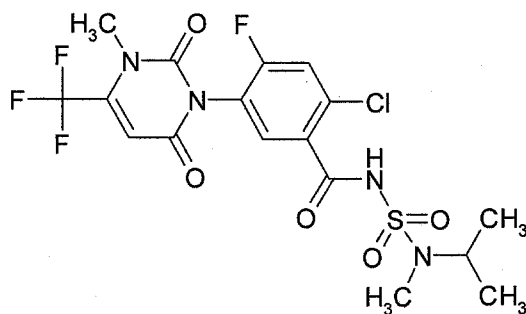
CAS Name: 2-Chloro-5-[3,6-dihydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)-1(2H)-pyrimidinyl]-4-fluoro-N-[[methyl(1-methylethyl)amino]sulfonyl]benzamide.

CAS Number: 372137-35-4.

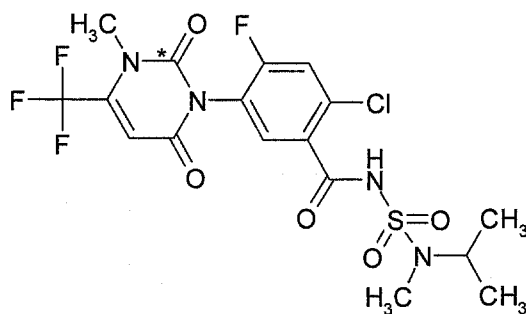
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Empirical formula: C₁₇H₁₇ClF₄N₄O₅S **Molecular formula:** C₁₇H₁₇ClF₄N₄O₅S

Unlabeled



[Uracil-4-¹⁴C]Saflufenacil



* = Location of the radiolabel.

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Saflufenacil [BAS 800 H, CL No. 433379, 4054449, AC 433,379]

IUPAC Name: N'-{2-Chloro-4-fluoro-5-[1,2,3,6-tetrahydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)pyrimidin-1-yl]benzoyl}-N-isopropyl-N-methylsulfamide.
N'-[2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)benzoyl]-N-isopropyl-N-methylsulfamide.

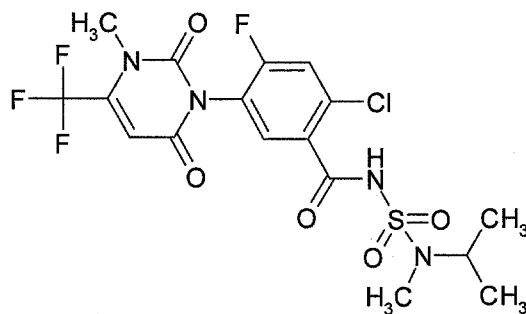
CAS Name: 2-Chloro-5-[3,6-dihydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)-1(2H)-pyrimidinyl]-4-fluoro-N-[[methyl(1-methylethyl)amino]sulfonyl]benzamide.

CAS Number: 372137-35-4.

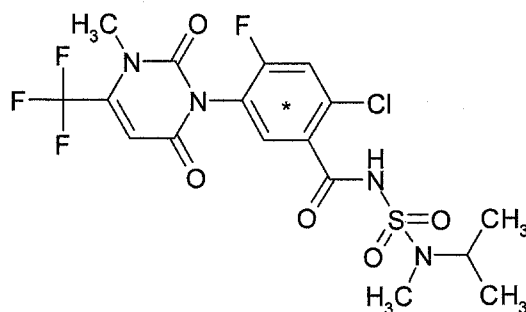
SMILES String: N1(C)C(C(F)(F)F)=CC(=O)N(C2=CC(C(=O)NS(=O)(=O)N(C)C(C)C)=C(Cl)C=C2F)C1=O (EPI Suite v3.12 SMILES string from ISIS .MOL).

Empirical formula: C₁₇H₁₇ClF₄N₄O₅S **Molecular formula:** C₁₇H₁₇ClF₄N₄O₅S

Unlabeled



[Phenyl-U-¹⁴C]Saflufenacil



* = Location of the radiolabel.

Data Evaluation Record on the photolysis of saflufenacil (BAS 800 H) in water

PMRA Document Number 1731028

EPA MRID Number 47699901

PMRA Submission Number 2008-0431

Identified Compounds

Data Evaluation Record on the photolysis of saflufenacil (BAS 800 H) in water

PMRA Document Number 1731028

EPA MRID Number 47699901

PMRA Submission Number 2008-0431

Saflufenacil [BAS 800 H, CL No. 433379, 4054449, AC 433,379]

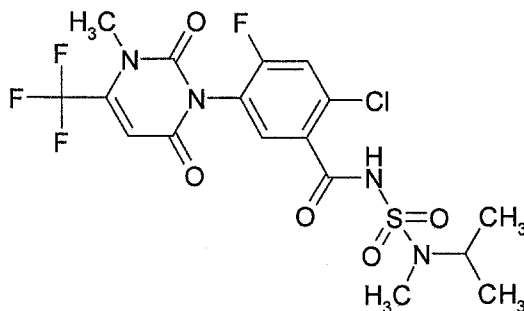
IUPAC Name: N'-{2-Chloro-4-fluoro-5-[1,2,3,6-tetrahydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)pyrimidin-1-yl]benzoyl}-N-isopropyl-N-methylsulfamide.
N'-[2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)benzoyl]-N-isopropyl-N-methylsulfamide.

CAS Name: 2-Chloro-5-[3,6-dihydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)-1(2H)-pyrimidinyl]-4-fluoro-N-[[methyl(1-methylethyl)amino]sulfonyl]benzamide.

CAS Number: 372137-35-4.

SMILES String: N1(C)C(C(F)(F)F)=CC(=O)N(C2=CC(C(=O)NS(=O)(=O)N(C)C(C)C)=C(Cl)C=C2F)C1=O (EPI Suite v3.12 SMILES string from ISIS .MOL).

Empirical formula: C₁₇H₁₇ClF₄N₄O₅S **Molecular formula:** C₁₇H₁₇ClF₄N₄O₅S

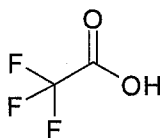


TFA [M800H29]

IUPAC Name: Trifluoroacetic acid.

CAS Name: Not reported.

CAS Number: Not reported.



Data Evaluation Record on the photolysis of saflufenacil (BAS 800 H) in water

PMRA Document Number 1731028
PMRA Submission Number 2008-0431

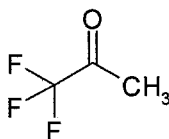
EPA MRID Number 47699901

1,1,1-Trifluoroacetone [M800H33, TF acetone]

IUPAC Name: 1,1,1-Trifluoroacetone.

CAS Name: Not reported.

CAS Number: 421-50-1.

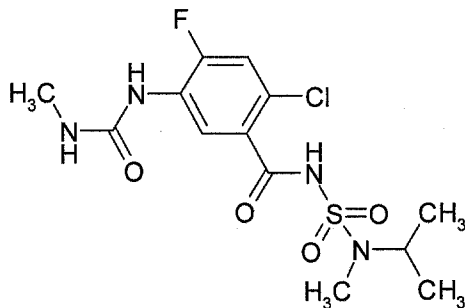


M800H07 [4775453]

IUPAC Name: N-{4-Chloro-2-fluoro-5-[[({[isopropyl(methyl)amino]sulfonyl}amino)carbonyl]phenyl}-N'-methylurea.

CAS Name: Not reported.

CAS Number: Not reported.



Data Evaluation Record on the photolysis of saflufenacil (BAS 800 H) in water

PMRA Document Number 1731028

EPA MRID Number 47699901

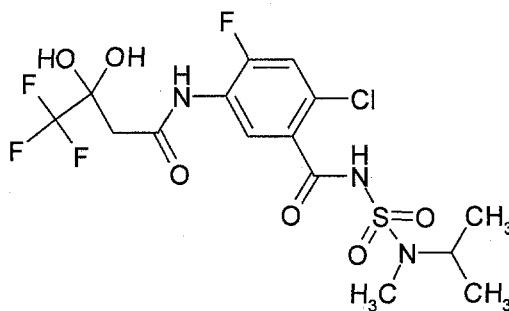
PMRA Submission Number 2008-0431

M800H15 [M800H15-ketohydrate, "Ketohydrate", 5264357]

IUPAC Name: N-{4-Chloro-2-fluoro-5-
[({[isopropyl(methyl)amino]sulfonyl}amino)carbonyl]phenyl}-4-4-4-
trifluoro-3,3-dihydroxybutanamide.

CAS Name: Not reported.

CAS Number: Not reported.

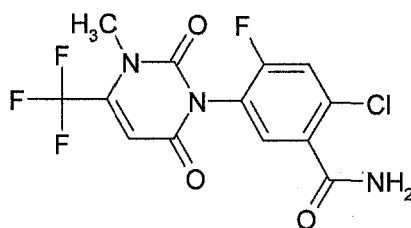


M800H25

IUPAC Name: 2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-
1(2H)-pyrimidinyl)benzamide.

CAS Name: Not reported.

CAS Number: Not reported.



Data Evaluation Record on the photolysis of saflufenacil (BAS 800 H) in water

PMRA Document Number 1731028

EPA MRID Number 47699901

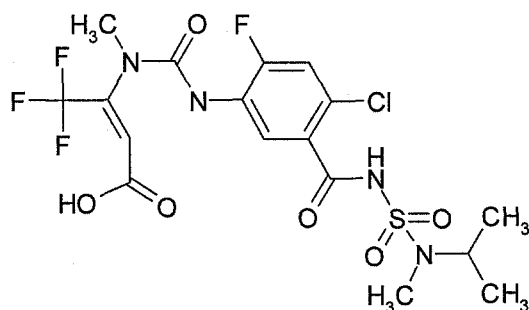
PMRA Submission Number 2008-0431

M800H04

IUPAC Name: Not reported.

CAS Name: Not reported.

CAS Number: Not reported.

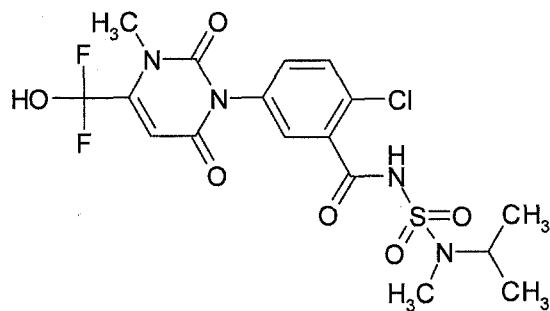


Unknown 7 (hydroxyl methyl degradate)

IUPAC Name: 2-Chloro-5-[4-[difluoro(hydroxyl)methyl]-3-methyl-2,6-dioxo-3,6-dihydropyrimidin-1(2H)-yl]-N-[[isopropyl(methyl)amino]sulfonyl]benzamide (ISIS/Draw with ACD/Name add-in).

CAS Name: Not reported.

CAS Number: Not reported.



Data Evaluation Record on the photolysis of saflufenacil (BAS 800 H) in water

PMRA Document Number 1731028

EPA MRID Number 47699901

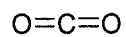
PMRA Submission Number 2008-0431

Carbon Dioxide

IUPAC Name: Carbon dioxide.

CAS Name: Carbon dioxide.

CAS Number: 124-38-9.



Data Evaluation Record on the photolysis of saflufenacil (BAS 800 H) in water

PMRA Document Number 1731028

EPA MRID Number 47699901

PMRA Submission Number 2008-0431

Unidentified Reference Compounds

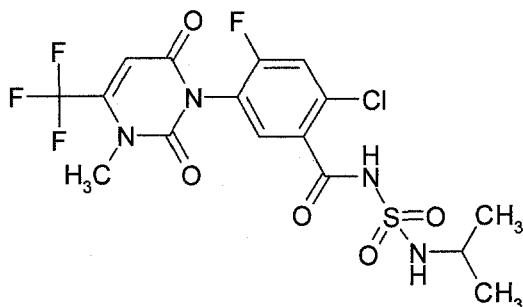
Data Evaluation Record on the photolysis of saflufenacil (BAS 800 H) in water

PMRA Document Number 1731028
PMRA Submission Number 2008-0431

EPA MRID Number 47699901

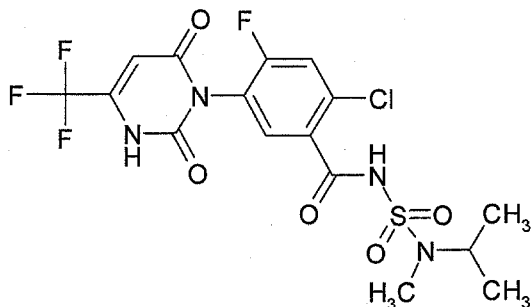
M800H01 [4118561]

IUPAC Name: N'-[2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)benzoyl]-N'-isopropylsulfamide.
CAS Name: Not reported.
CAS Number: Not reported.



M800H02 [4118416]

IUPAC Name: N'-[2-Chloro-5-(2,6-dioxo-4-(trifluoromethyl)-3,6-dihydropyrimidin-1(2H)-yl)-4-fluorobenzoyl]-N-isopropyl-N-methylsulfamide.
N'-[2-Chloro-5-(2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)-4-fluorobenzoyl]-N-isopropyl-N-methylsulfamide.
CAS Name: Not reported.
CAS Number: Not reported.



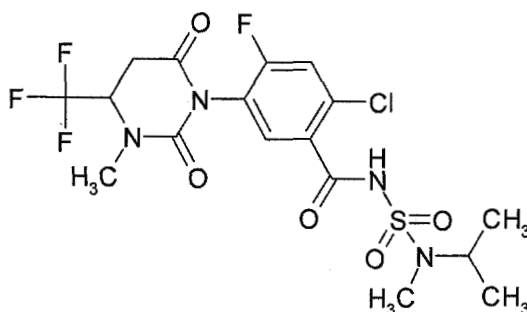
Data Evaluation Record on the photolysis of saflufenacil (BAS 800 H) in water

PMRA Document Number 1731028
PMRA Submission Number 2008-0431

EPA MRID Number 47699901

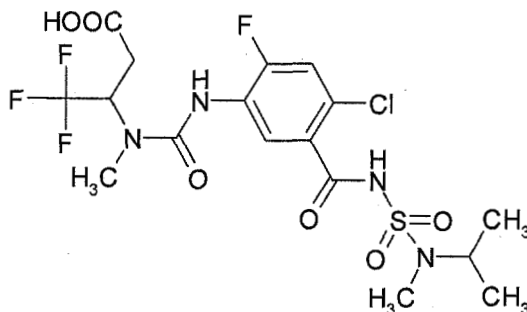
M800H08 [4773881]

IUPAC Name: N'-[2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)tetrahydro-1(2H)-pyrimidinyl)benzoyl]-N-isopropyl-N-methylsulfamide.
CAS Name: Not reported.
CAS Number: Not reported.



M800H22 [5216337]

IUPAC Name: 3-[(4-Chloro-2-fluoro-5-[[[isopropyl(methyl)amino]sulfonyl]amino]carbonyl]anilino)carbonyl](methylamino)-4,4,4-trifluorobutanoic acid.
CAS Name: Not reported.
CAS Number: Not reported.



Attachment 2: Excel Spreadsheets

Chemical: Saflufenacil
MRID: 47127824
PC Code: 118203
Guideline: 835.2240

Phenyl Label
Irradiated pH 5 Buffer

Days posttreatment	% applied radioactivity		
	In Buffer	Volatiles	Total
0	99.89	0.0	99.89
0	100.00	0.0	100.00
Average		0.0	99.95
SD		0.0	0.08
2	102.44	0.01	102.45
2	100.45	0.00	100.45
Average		0.01	101.45
SD		0.01	1.41
7	100.92	0.89	101.81
7	99.35	0.09	99.44
Average		0.49	100.63
SD		0.57	1.68
10	100.34	0.77	101.11
10	95.46	0.26	95.72
Average		0.52	98.42
SD		0.36	3.81
15	100.02	2.74	102.76
15	92.91	0.34	93.25
Average		1.54	98.01
SD		1.70	6.72
20	97.39	1.78	99.17
20	88.99	0.45	89.44
Average		1.12	94.31
SD		0.94	6.88
Total Average			98.79
SD			4.01

Data obtained from Table 4, p. 31 of the study report.

Phenyl Label
Dark Control pH 5 Buffer

Days posttreatment	% applied radioactivity		
	Total	Average	SD
0	99.89	99.95	0.08
0	100.00		
2	100.81	102.06	1.77
2	103.31		
7	101.52	101.84	0.45
7	102.16		
10	100.15	99.90	0.35
10	99.65		
15	100.72	102.00	1.80
15	103.27		
20	102.10	101.28	1.16
20	100.46		
Total		101.17	1.28

Data obtained from Table 3, p. 30 of the study report.

Chemical: Saflufenacil
MRID: 47127824
PC Code: 118203
Guideline: 835.2240

Uracil Label
Irradiated pH 5 Buffer

Days posttreatment	% applied radioactivity		
	In Buffer	Volatiles	Total
0	100.00	0.0	100.00
0	101.72	0.0	101.72
Average		0.0	100.86
SD		0.0	1.22
2	99.52	0.00	99.52
2	98.79	0.00	98.79
Average		0.00	99.16
SD		0.00	0.52
7	98.59	0.15	98.74
7	101.41	0.01	101.42
Average		0.08	100.08
SD		0.10	1.90
10	97.94	0.25	98.19
10	96.97	0.02	96.99
Average		0.14	97.59
SD		0.16	0.85
15	99.85	0.72	100.57
15	94.39	0.08	94.47
Average		0.40	97.52
SD		0.45	4.31
20	94.54	2.07	96.61
20	92.87	0.12	92.99
Average		1.10	94.80
SD		1.38	2.56
Total Average			98.33
SD			2.68

Data obtained from Table 6, p. 33 of the study report.

Uracil Label
Dark Control pH 5 Buffer

Days posttreatment	% applied radioactivity		
	Total	Average	SD
0	100.00	100.86	1.22
0	101.72		
2	100.50	100.24	0.37
2	99.97		
7	100.24	100.20	0.06
7	100.15		
10	99.63	98.23	1.99
10	96.82		
15	98.93	99.00	0.10
15	99.07		
20	100.81	99.94	1.23
20	99.07		
Total		99.74	1.22

Data obtained from Table 5, p. 32 of the study report.

Chemical: Saflufenacil
MRID: 47127824
PC Code: 118203
Guideline: 835.2240

Phenyl Label
Irradiated Natural Water

Days posttreatment	% applied radioactivity		
	In Water	Volatiles	Total
0	100.00	0.0	100.00
0	102.26	0.0	102.26
Average		0.0	101.13
SD		0.0	1.60
1	100.93	0.00	100.93
1	100.36	0.00	100.36
Average		0.00	100.65
SD		0.00	0.40
2	99.92	0.01	99.93
2	100.80	0.02	100.82
Average		0.02	100.38
SD		0.01	0.63
4	99.74	0.07	99.81
4	100.91	0.08	100.99
Average		0.08	100.40
SD		0.01	0.83
7	98.75	0.28	99.03
7	99.08	0.24	99.32
Average		0.26	99.18
SD		0.03	0.21
10	91.39	0.42	91.81
10	94.94	0.56	95.50
Average		0.49	93.66
SD		0.10	2.61
15	75.53	1.01	76.54
15	83.98	0.81	84.79
Average		0.91	80.67
SD		0.14	5.83
21	82.23	1.60	84.83
21	85.68	1.68	87.36
Average		1.64	86.10
SD		0.06	1.79
Total Average			95.27
SD			7.79

Data obtained from Table 8, p. 35 of the study report.

Phenyl Label
Dark Control Natural Water

Days posttreatment	% applied radioactivity		
	Total	Average	SD
0			
0	100.91		
1			
1	99.65		
2			
2	99.35		
4			
4	100.28		
7			
7	98.68		
10			
10	100.41		
15			
15	99.84		
21			
21	101.19		
Total		100.04	0.83

Data obtained from Table 7, p. 34 of the study report.

Replicate 1 was contaminated; data not reported.

Chemical: Saflufenacil
MRID: 47127824
PC Code: 118203
Guideline: 835.2240

Uracil Label
Irradiated Natural Water

Days posttreatment	% applied radioactivity		
	In Water	Volatiles	Total
0	100.00	0.0	100.00
0	100.02	0.0	100.02
Average		0.0	100.01
SD		0.0	0.01
1	98.71	0.01	98.72
1	95.79	0.01	95.80
Average		0.01	97.26
SD		0.00	2.06
2	96.23	0.02	96.25
2	98.51	0.02	98.53
Average		0.02	97.39
SD		0.00	1.61
4	100.07	0.08	100.15
4	100.63	0.11	100.74
Average		0.10	100.45
SD		0.02	0.42
7	95.52	0.48	96.00
7	97.02	0.16	97.18
Average		0.32	96.59
SD		0.23	0.83
10	89.63	2.12	91.75
10	94.27	1.28	95.55
Average		1.70	93.65
SD		0.59	2.69
15	95.36	0.78	96.14
15	96.37	0.63	97.00
Average		0.71	96.57
SD		0.11	0.61
21	79.13	3.00	82.13
21	89.65	1.10	90.75
Average		2.05	86.44
SD		1.34	6.10
Total Average			96.04
SD			4.66

Data obtained from Table 10, p. 37 of the study report.

Uracil Label
Dark Control Natural Water

Days posttreatment	% applied radioactivity		
	Total	Average	SD
0	101.02	101.44	0.59
0	101.85		
1	98.83	100.37	2.18
1	101.91		
2	97.66	98.96	1.84
2	100.26		
4	97.71	99.12	1.99
4	100.53		
7	100.02	100.01	0.02
7	99.99		
10	96.81	97.16	0.49
10	97.50		
15	96.80	97.52	1.01
15	98.23		
21	95.44	96.97	2.16
21	98.50		
Total		98.94	1.92

Data obtained from Table 9, p. 36 of the study report.

Chemical: Saflufenacil
MRID: 47127824
PC Code: 118203
Guideline: 835.2240

Phenyl Label in pH 5 Buffer
Irradiated

Days posttreatment	% applied radioactivity				% applied radioactivity				% applied radioactivity		
	Parent	Average	SD		Unk 1	Average	SD		Unk 2	Average	SD
0	99.89	99.95	0.08	--		#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!
0	100.00			--				--			
2	100.00	99.22	1.11	--		#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!
2	98.43			--				--			
7	93.30	91.65	2.33	--		#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!
7	90.00			--				--			
10	90.78	84.52	8.86	--		#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!
10	78.25			--				--			
15	84.37	73.95	14.74	--		#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!
15	63.53			--				--			
20	79.78	67.18	17.82	--		3.52	#DIV/0!	--		1.03	#DIV/0!
20	54.58			--				--			

Days posttreatment	% applied radioactivity				% applied radioactivity				% applied radioactivity		
	Unk 3	Average	SD		Unk 4	Average	SD		Unk 5 (M800H25)	Average	SD
0		#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!
0				--				--			
2		#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!
2				--				--			
7		#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!	--			
7				--				--	1.27	1.23	0.06
10	0.85	1.20	0.49	--		1.14	#DIV/0!	--	1.18		
10	1.55			--	1.14			--	1.63	1.41	0.31
15	2.21	3.24	1.45	--		1.67	#DIV/0!	--	1.19		
15	4.26			--	1.67			--	0.94	1.56	0.88
20	1.70	2.80	1.56	--		0.92	#DIV/0!	--	2.18		
20	3.90			--	0.92			--	2.84	2.87	0.04
				--				--	2.89		

Days posttreatment	% applied radioactivity			% applied radioactivity			% applied radioactivity				
	Unk 6 (M800H07)	Average	SD	Unk 7 (HMD)	Average	SD	Unk 8 (M800H15)	Average	SD		
0	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!		
0	--			--			--				
2	--	#DIV/0!	#DIV/0!		2.44	2.23	0.30	--	#DIV/0!	#DIV/0!	
2	--				2.02			--			
7		2.32	3.25	1.32	4.04	4.02	0.04	--	#DIV/0!	#DIV/0!	
7		4.18			3.99			--			
10		2.29	3.38	1.54	3.21	4.26	1.48	--	#DIV/0!	#DIV/0!	
10		4.47			5.30			--			
15		4.12	5.69	2.22	4.03	3.92	0.16	--	0.61	#DIV/0!	
15		7.26			3.81				0.61		
20		5.14	6.85	2.41	3.39	2.94	0.64		1.89	2.10	0.30
20		8.55			2.48				2.31		

Days posttreatment	% applied radioactivity				% applied radioactivity		
	Unk 10 (M800H04)	Average	SD		Unk 11	Average	SD
0		#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!
0				--			
2		#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!
2				--			
7		#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!
7				--			
10	1.59	1.88	0.41	--		1.39	#DIV/0!
10	2.17			--	1.39		
15	1.58	2.46	1.24	--		1.77	#DIV/0!
15	3.33			--	1.77		
20	1.64	2.12	0.67	--	1.01	2.02	1.43
20	2.59			--	3.03		

Data obtained from Table 12, p. 39 of the study report.

Chemical: Saflufenacil
MRID: 47127824
PC Code: 118203
Guideline: 835.2240

Uracil Label in pH 5 Buffer
Irradiated

Days posttreatment	% applied radioactivity			% applied radioactivity			% applied radioactivity		
	Parent	Average	SD	Unk 1	Average	SD	Unk 2	Average	SD
0	100.00	100.86	1.22	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!
0	101.72			--			--		
2	95.87	95.60	0.38	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!
2	95.33			--			--		
7	86.34	89.04	3.82	2.64	2.64	#DIV/0!	--	#DIV/0!	#DIV/0!
7	91.74			--			--		
10	77.30	76.53	1.10	1.70	1.32	0.54	1.17	1.17	#DIV/0!
10	75.75			0.93			--		
15	71.59	64.31	10.30	2.72	2.45	0.38	--	2.00	#DIV/0!
15	57.03			2.18			--		
20	69.70	60.71	12.72	3.44	3.72	0.40	1.94	2.55	0.86
20	51.71			4.00			3.15		

Days posttreatment	% applied radioactivity			% applied radioactivity			% applied radioactivity		
	Unk 3	Average	SD	Unk 4	Average	SD	Unk 6	Average	SD
0	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!
0	--			--			--		
2	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	1.53	1.42	0.16
2	--			--			1.30		
7	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	2.01	1.73	0.40
7	--			--			1.44		
10	0.98	0.84	0.21	0.94	1.44	0.70	1.99	2.23	0.34
10	0.69			1.93			2.47		
15	1.61	1.44	0.24	3.60	4.11	0.72	2.49	1.94	0.78
15	1.27			4.62			1.38		
20	1.70	2.15	0.63	3.63	4.07	0.62	1.97	1.56	0.59
20	2.59			4.51			1.14		

Days posttreatment	% applied radioactivity			% applied radioactivity			% applied radioactivity		
	Unk 7	Average	SD	Unk 8	Average	SD	Unk 9	Average	SD
0	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!
0	--			--			--		
2	--	#DIV/0!	#DIV/0!	2.12	2.14	0.03	--	#DIV/0!	#DIV/0!
2	--			2.16			--		
7	4.06	3.95	0.16	3.53	3.96	0.61	--	#DIV/0!	#DIV/0!
7	3.83			4.39			--		
10	5.17	4.88	0.42	2.50	2.92	0.59	--	#DIV/0!	#DIV/0!
10	4.58			3.33			--		
15	6.81	6.00	1.15	3.06	2.96	0.14	--	#DIV/0!	#DIV/0!
15	5.18			2.86			--		
20	7.06	6.63	0.61	2.00	1.83	0.24	1.08	1.10	0.02
20	6.20			1.66			1.11		

Days posttreatment	% applied radioactivity			% applied radioactivity			% applied radioactivity		
	Unk 10	Average	SD	Unk 11	Average	SD	Unk 12	Average	SD
0	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!
0	--			--			--		
2	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!
2	--			--			--		
7	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!
7	--			--			--		
10	1.51	1.51	#DIV/0!	1.69	2.08	0.54	--	#DIV/0!	#DIV/0!
10	--			2.46			--		
15	1.13	1.91	1.10	1.98	2.07	0.12	1.40	1.40	#DIV/0!
15	2.69			2.15			--		
20	--	#DIV/0!	#DIV/0!	1.43	2.75	1.86	--	#DIV/0!	#DIV/0!
20	--			4.06			--		

Data obtained from Table 14, p. 41 of the study report.

Chemical: Saflufenacil
MRID: 47127824
PC Code: 118203
Guideline: 835.2240

Phenyl Label pH 5 Buffer Dark Controls

Days posttreatment	% applied radioactivity		
	Parent	Average	SD
0	99.89	99.95	0.08
0	100.00		
2	100.81	102.06	1.77
2	103.31		
7	101.52	101.84	0.45
7	102.16		
10	100.15	99.90	0.35
10	99.65		
15	100.72	102.00	1.80
15	103.27		
20	102.10	101.28	1.16
20	100.46		

Data obtained from Table 11, p. 38 of the study report.

Uracil Label pH 5 Buffer Dark Controls

Days posttreatment	% applied radioactivity		
	Parent	Average	SD
0	100.00	100.86	1.22
0	101.72		
2	100.50	100.24	0.37
2	99.97		
7	100.24	100.20	0.06
7	100.15		
10	99.63	98.23	1.99
10	96.82		
15	98.93	99.00	0.10
15	99.07		
20	100.81	99.94	1.23
20	99.07		

Data obtained from Table 13, p. 40 of the study report.

Chemical: Saflufenacil
MRID: 47127824
PC Code: 118203
Guideline: 835.2240

**Phenyl Label in Natural Water
 Irradiated**

Days posttreatment	% applied radioactivity				% applied radioactivity				% applied radioactivity		
	Parent	Average	SD		Unk 1	Average	SD		Unk 2	Average	SD
0	100.00	101.13	1.60	--		#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!
0	102.26			--				--			
1	98.37	97.31	1.51	--		#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!
1	96.24			--				--			
2	94.00	94.60	0.85	--		#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!
2	95.20			--				--			
4	85.84	87.70	2.63	--		#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!
4	89.56			--				--			
7	76.81	78.16	1.91	--		0.39	#DIV/0!	--		#DIV/0!	#DIV/0!
7	79.51			--	0.39			--			
10	61.58	65.22	5.14	--	0.88	0.82	0.08	--		#DIV/0!	#DIV/0!
10	68.85			--	0.76			--			
15	34.74	35.65	1.28	--	2.39	2.76	0.52	--		#DIV/0!	#DIV/0!
15	36.55			--	3.12			--			
21	18.52	19.26	1.05	--	6.80	6.99	0.26	--	1.95	1.73	0.32
21	20.00			--	7.17			--	1.50		

Days posttreatment	% applied radioactivity				% applied radioactivity				% applied radioactivity		
	Unk 3	Average	SD		Unk 4	Average	SD		Unk 5	Average	SD
0	--	#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!
0	--			--				--			
1	--	#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!
1	--			--				--			
2	--	#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!
2	--			--				--			
4	--	#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!
4	--			--				--			
7	--	0.85	#DIV/0!	--		#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!
7	0.85			--				--			
10	1.07	1.20	0.18	--		#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!
10	1.32			--				--			
15	3.08	3.50	0.59	--		#DIV/0!	#DIV/0!	--	1.84	1.84	#DIV/0!
15	3.91			--				--			
21	9.52	9.17	0.49	--	2.51	2.11	0.57	--	2.48	1.58	1.27
21	8.82			--	1.71			--	0.68		

Data obtained from Table 16, p. 43 of the study report.

Chemical: Saflufenacil
MRID: 47127824
PC Code: 118203
Guideline: 835.2240

**Phenyl Label in Natural Water
 Irradiated**

Days posttreatment		% applied radioactivity			% applied radioactivity			% applied radioactivity		
		Unk 6	Average	SD	Unk 7	Average	SD	Unk 8	Average	SD
0	--		#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!
0	--				--			--		
1	--		#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!
1	--				--			--		
2	--		#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!
2	--				--			--		
4	--		#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!
4	--				--			--		
7		0.56	0.70	0.19	--	#DIV/0!	#DIV/0!	0.96	0.67	0.42
7		0.83			--			0.37		
10		1.02	1.02	#DIV/0!	--	#DIV/0!	#DIV/0!	0.94	0.94	#DIV/0!
10	--				--			--		
15		1.33	1.47	0.19	--	2.17	#DIV/0!	1.75	1.74	0.01
15		1.60			2.17			1.73		
21		2.80	2.51	0.42	1.85	1.99	0.20	1.26	1.13	0.18
21		2.21			2.13			1.00		

Days posttreatment	% applied radioactivity			% applied radioactivity			% applied radioactivity		
	Unk 9	Average	SD	Unk 10	Average	SD	Unk 11	Average	SD
0	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!
0	--			--			--		
1	--	#DIV/0!	#DIV/0!	0.58	0.68	0.14	--	0.72	#DIV/0!
1	--			0.78					
2	--	#DIV/0!	#DIV/0!	0.74	0.85	0.16		1.43	1.26
2	--			0.96				1.09	0.24
4		1.23	0.98	0.35	1.09	1.26	0.24	3.03	3.00
4		0.73			1.43			2.96	0.05
7		1.44	1.24	0.29	1.32	1.29	0.05	6.36	5.82
7		1.03			1.25			5.27	0.77
10		0.95	1.16	0.30	1.04	1.02	0.03	8.32	7.81
10		1.37			1.00			7.29	0.73
15		1.35	1.27	0.11	1.67	1.48	0.27	8.88	9.19
15		1.19			1.29			9.49	0.43
21		1.69	1.65	0.06	0.66	0.93	0.38	9.32	8.78
21		1.60			1.20			8.23	0.77

Data obtained from Table 16, p. 43 of the study report.

Chemical: Saflufenacil
MRID: 47127824
PC Code: 118203
Guideline: 835.2240

Phenyl Label in Natural Water
Irradiated

Days posttreatment	% applied radioactivity			% applied radioactivity			% applied radioactivity		
	Unk 12	Average	SD	Unk 13	Average	SD	Unk 14	Average	SD
0	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!
0	--			--			--		
1	--	#DIV/0!	#DIV/0!	0.77	0.86	0.12	--	#DIV/0!	#DIV/0!
1	--			0.94			--		
2	--	#DIV/0!	#DIV/0!	1.23	1.36	0.18	--	#DIV/0!	#DIV/0!
2	--			1.49			--		
4	--	#DIV/0!	#DIV/0!	2.62	2.52	0.15	--	#DIV/0!	#DIV/0!
4	--			2.41			--		
7	--	#DIV/0!	#DIV/0!	4.04	3.64	0.57	--	#DIV/0!	#DIV/0!
7	--			3.24			--		
10	--	#DIV/0!	#DIV/0!	6.40	5.92	0.68	--	#DIV/0!	#DIV/0!
10	--			5.44			--		
15	4.01	4.07	0.08	3.31	3.33	0.03	--	#DIV/0!	#DIV/0!
15	4.13			3.35			--		
21	--	#DIV/0!	#DIV/0!	3.60	4.42	1.16	2.93	2.10	1.18
21	--			5.24			1.26		

Days posttreatment	% applied radioactivity			% applied radioactivity			% applied radioactivity		
	Unk 15	Average	SD	Unk 16	Average	SD	Unk 17	Average	SD
0	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!
0	--			--			--		
1	0.54	0.69	0.21	--	#DIV/0!	#DIV/0!	0.67	0.76	0.13
1	0.83			--			0.85		
2	0.86	0.85	0.01	--	#DIV/0!	#DIV/0!	1.08	0.93	0.22
2	0.84			--			0.77		
4	0.96	0.72	0.35	--	#DIV/0!	#DIV/0!	2.79	2.50	0.42
4	0.47			--			2.20		
7	0.67	0.65	0.03	--	0.61	#DIV/0!	3.89	3.73	0.23
7	0.63			0.61			3.56		
10	1.23	0.85	0.54	0.54	0.67	0.18	4.19	4.09	0.14
10	0.46			0.80			3.99		
15	0.86	1.01	0.21	--	1.02	#DIV/0!	4.51	3.95	0.79
15	1.16			1.02			3.39		
21	--	0.68	#DIV/0!	--	0.62	#DIV/0!	--	2.98	#DIV/0!
21	0.68			0.62			2.98		

Data obtained from Table 16, p. 44 of the study report.

Chemical: Saflufenacil
MRID: 47127824
PC Code: 118203
Guideline: 835.2240

Phenyl Label in Natural Water
Irradiated

Days posttreatment	% applied radioactivity			% applied radioactivity		
	Unk 18	Average	SD	Unk 19	Average	SD
0	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!
0	--			--		
1	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!
1	--			--		
2	--	#DIV/0!	#DIV/0!		0.57	0.52
2	--				0.47	0.07
4	--	#DIV/0!	#DIV/0!		2.17	1.67
4	--				1.16	0.71
7	--	#DIV/0!	#DIV/0!		2.70	2.12
7	--				1.54	0.82
10	--	#DIV/0!	#DIV/0!		3.24	3.45
10	--				3.66	0.30
15	--	#DIV/0!	#DIV/0!		2.84	2.93
15	--				3.01	0.12
21	2.71	1.99	1.02	1.69	2.38	0.98
21	1.27			3.07		

Data obtained from Table 16, p. 44 of the study report.

Chemical: Saflufenacil
MRID: 47127824
PC Code: 118203
Guideline: 835.2240

Uracil Label in Natural Water
Irradiated

Days posttreatment	% applied radioactivity				% applied radioactivity				% applied radioactivity		
	Parent	Average	SD		Unk 1	Average	SD		Unk 2	Average	SD
0	100.00	100.01	0.01	--		#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!
0	100.02			--				--			
1	96.34	95.34	1.42	--		#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!
1	94.33			--				--			
2	89.71	91.06	1.91	--		#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!
2	92.41			--				--			
4	87.64	87.81	0.24	--		#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!
4	87.98			--				--			
7	76.02	74.14	2.66	--		#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!
7	72.26			--				--			
10	56.01	58.15	3.03	--		#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!
10	60.29			--				--			
15	28.31	34.55	8.82		0.95	1.10	0.2		2.02	1.53	0.7
15	40.79				1.24				1.03		
21	13.40	18.52	7.23		1.15	1.00	0.2		2.81	2.38	0.62
21	23.63				0.85				1.94		

Days posttreatment	% applied radioactivity				% applied radioactivity				% applied radioactivity		
	Unk 3 (TFA)	Average	SD		Unk 4 (trifluor)	Average	SD		Unk 5	Average	SD
0	--	#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!
0	--			--				--			
1	--	#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!	--		#DIV/0!	#DIV/0!
1	--			--				--			
2	1.19	1.15	0.06		0.39	0.51	0.16	--		#DIV/0!	#DIV/0!
2	1.11				0.62			--			
4	2.12	2.66	0.76		1.96	1.83	0.19		0.69	0.80	0.16
4	3.19				1.69				0.91		
7	4.56	5.80	1.75		3.78	3.74	0.06		1.42	1.73	0.44
7	7.04				3.70				2.04		
10	10.53	11.18	0.91		8.43	6.94	2.11		2.11	2.55	0.62
10	11.82				5.45				2.99		
15	25.04	22.43	3.69		19.66	13.55	8.64		2.33	3.17	1.19
15	19.82				7.44				4.01		
21	28.78	28.92	0.19		16.93	13.25	5.21		1.97	2.95	1.39
21	29.05				9.56				3.93		

Data obtained from Table 18, p. 46 of the study report.

Chemical: Saflufenacil
MRID: 47127824
PC Code: 118203
Guideline: 835.2240

Uracil Label in Natural Water
Irradiated

Days posttreatment	% applied radioactivity			% applied radioactivity			% applied radioactivity		
	Unk 6	Average	SD	Unk 7	Average	SD	Unk 8	Average	SD
0	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!
0	--			--			--		
1	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	1.00	1.00	0.00
1	--			--			1.00		
2	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	1.26	1.07	0.28
2	--			--			0.87		
4	0.64	0.64	#DIV/0!	--	#DIV/0!	#DIV/0!	1.27	1.22	0.07
4	--			--			1.17		
7	0.60	1.34	1.05	--	#DIV/0!	#DIV/0!	1.33	1.48	0.21
7	2.08			--			1.63		
10	1.10	1.20	0.14	--	0.32	#DIV/0!	1.56	1.46	0.15
10	1.30						1.35		
15	3.04	3.18	0.20		1.44	1.54	0.1	0.60	0.8
15	3.32				1.63			1.14	
21	2.62	2.48	0.20		1.21	0.89	0.5	1.26	0.3
21	2.34				0.56			1.47	
							1.67		

Days posttreatment	% applied radioactivity			% applied radioactivity			% applied radioactivity			
	Unk 9	Average	SD	Unk 10	Average	SD	Unk 11	Average	SD	
0	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	
0	--			--			--			
1	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	
1	--			--			--			
2	--	#DIV/0!	#DIV/0!		1.18	1.21	0.04	--	#DIV/0!	#DIV/0!
2	--				1.24			--		
4	--	#DIV/0!	#DIV/0!		2.27	1.98	0.42	--	#DIV/0!	#DIV/0!
4	--				1.68			--		
7	--	#DIV/0!	#DIV/0!		2.40	2.56	0.23	--	#DIV/0!	#DIV/0!
7	--				2.72			--		
10	--	#DIV/0!	#DIV/0!		2.49	2.81	0.45	--	#DIV/0!	#DIV/0!
10	--				3.12			--		
15	--	#DIV/0!	#DIV/0!	--		4.92	#DIV/0!	3.26	3.26	#DIV/0!
15	--				4.92			--		
21	--	1.67	#DIV/0!		1.62	2.11	0.69	1.01	1.06	0.1
21		1.67			2.59			1.11		

Data obtained from Table 18, p. 46 of the study report.

Chemical: Saflufenacil
MRID: 47127824
PC Code: 118203
Guideline: 835.2240

**Uracil Label in Natural Water
 Irradiated**

Days posttreatment	% applied radioactivity			% applied radioactivity			% applied radioactivity		
	Unk 12	Average	SD	Unk 13	Average	SD	Unk 14	Average	SD
0	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!
0	--			--			--		
1	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	1.36	0.91	0.64
1	--			--			0.45		
2	0.49	0.62	0.18	0.41	0.41	#DIV/0!	0.79	0.84	0.06
2	0.75			--			0.88		
4	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	2.05	2.39	0.48
4	--			--			2.73		
7	0.36	0.36	#DIV/0!	--	#DIV/0!	#DIV/0!	2.55	3.10	0.77
7	--			--			3.64		
10	--	0.42	#DIV/0!	--	0.80	#DIV/0!	5.37	4.69	0.96
10	0.42			0.80			4.01		
15	0.88	1.11	0.33	0.88	0.88	#DIV/0!	4.22	4.22	0.00
15	1.34			--			4.22		
21	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	1.79	2.87	1.52
21	--			--			3.94		

Data obtained from Table 18, pp. 46-47 of the study report.

Days posttreatment	% applied radioactivity		
	Unk 15	Average	SD
0	--	#DIV/0!	#DIV/0!
0	--		
1	--	#DIV/0!	#DIV/0!
1	--		
2	0.81	0.72	0.13
2	0.63		
4	1.43	1.36	0.10
4	1.29		
7	2.52	2.22	0.43
7	1.91		
10	2.02	2.20	0.25
10	2.38		
15	1.04	1.42	0.53
15	1.79		
21	0.68	1.08	0.56
21	1.47		

Data obtained from Table 18, p. 47 of the study report.

Chemical: Saflufenacil
MRID: 47127824
PC Code: 118203
Guideline: 835.2240

Phenyl Label in Natural Water
Dark Controls

Days posttreatment	% applied radioactivity			% applied radioactivity			% applied radioactivity		
	Parent	Average	SD	Unk 1	Average	SD	Unk 2	Average	SD
0		100.91	#DIV/0!		#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!
0	100.91			--			--		
1		98.20	#DIV/0!		0.50	#DIV/0!		0.49	#DIV/0!
1	98.20			0.50			0.49		
2		97.54	#DIV/0!		0.93	#DIV/0!		0.87	#DIV/0!
2	97.54			0.93			0.87		
4		98.88	#DIV/0!		0.49	#DIV/0!		0.91	#DIV/0!
4	98.88			0.49			0.91		
7		94.40	#DIV/0!		0.49	#DIV/0!		2.71	#DIV/0!
7	94.40			0.49			2.71		
10		92.73	#DIV/0!		0.58	#DIV/0!		5.06	#DIV/0!
10	92.73			0.58			5.06		
15		87.79	#DIV/0!		0.54	#DIV/0!		8.43	#DIV/0!
15	87.79			0.54			8.43		
21		83.35	#DIV/0!		#DIV/0!	#DIV/0!		13.32	#DIV/0!
21	83.35			--			13.32		

Days posttreatment	% applied radioactivity			% applied radioactivity			% applied radioactivity		
	Unk 3	Average	SD	Unk 4	Average	SD	Unk 5	Average	SD
0		#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!
0	--			--			--		
1		#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!		0.46	#DIV/0!
1	--			--			0.46		
2		#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!
2	--			--			--		
4		#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!
4	--			--			--		
7		#DIV/0!	#DIV/0!		0.45	#DIV/0!		0.35	#DIV/0!
7	--			0.45			0.35		
10		#DIV/0!	#DIV/0!		1.14	#DIV/0!		0.90	#DIV/0!
10	--			1.14			0.90		
15		#DIV/0!	#DIV/0!		1.84	#DIV/0!		1.25	#DIV/0!
15	--			1.84			1.25		
21		#DIV/0!	#DIV/0!		3.27	#DIV/0!		1.26	#DIV/0!
21	--			3.27			1.26		

Data obtained from Table 15, p. 42 of the study report.

Replicate 1 was contaminated, therefore the data was not reported.

Chemical: Saflufenacil
MRID: 47127824
PC Code: 118203
Guideline: 835.2240

Phenyl Label in Natural Water
Dark Controls

Days posttreatment	% applied radioactivity		
	Unk 6	Average	SD
0		#DIV/0!	#DIV/0!
0 --			
1		#DIV/0!	#DIV/0!
1 --			
2		#DIV/0!	#DIV/0!
2 --			
4		#DIV/0!	#DIV/0!
4 --			
7		0.28	#DIV/0!
7	0.28		
10		#DIV/0!	#DIV/0!
10 --			
15		#DIV/0!	#DIV/0!
15 --			
21		#DIV/0!	#DIV/0!
21 --			

Data obtained from Table 15, p. 42 of the study report.

Chemical: Saflufenacil
MRID: 47127824
PC Code: 118203
Guideline: 835.2240

Uracil Label in Natural Water
Dark Controls

Days posttreatment	% applied radioactivity			% applied radioactivity			% applied radioactivity		
	Parent	Average	SD	Unk 1(trifluoro)	Average	SD	Unk 2	Average	SD
0	101.02	101.44	0.59	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!
0	101.85			--			--		
1	98.23	99.76	2.16	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!
1	101.29			--			--		
2	96.06	97.81	2.47	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!
2	99.55			--			--		
4	95.38	96.92	2.17		1.49	1.13	0.51	#DIV/0!	#DIV/0!
4	98.45				0.77				
7	92.08	94.52	3.44		3.59	2.93	0.93	#DIV/0!	#DIV/0!
7	96.95				2.27				
10	83.88	88.42	6.42		8.14	5.35	3.95	#DIV/0!	#DIV/0!
10	92.96				2.56				
15	69.21	80.76	16.33		18.33	10.74	10.73	0.88	0.88
15	92.31				3.15				
21	49.13	69.66	29.03		30.31	17.88	17.59	1.32	1.14
21	90.19				5.44			0.96	0.25

Days posttreatment	% applied radioactivity			% applied radioactivity			% applied radioactivity		
	Unk 3	Average	SD	Unk 4	Average	SD	Unk 5	Average	SD
0	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!	--	#DIV/0!	#DIV/0!
0	--			--			--		
1		0.59	0.61	0.02	--	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
1		0.62			--				
2		0.71	0.71	0.00	--	#DIV/0!	#DIV/0!	0.89	0.89
2		0.71			--				
4		0.84	0.74	0.14	--	#DIV/0!	#DIV/0!		0.67
4		0.64			--			0.67	
7		0.65	0.71	0.08		1.41	1.41	#DIV/0!	2.29
7		0.77			--				2.29
10		0.64	0.63	0.02		2.53	1.65	1.24	1.62
10		0.61				0.77			1.11
15	--		0.61	#DIV/0!		4.72	2.92	2.55	0.59
15		0.61				1.11			3.67
21	--		0.67	#DIV/0!		8.47	4.85	5.12	2.37
21		0.67				1.23			1.06
21									4.84
21									4.84

Data obtained from Table 17, p. 45 of the study report.

Chemical: Saflufenacil
MRID: 47127824
PC Code: 118203
Guideline: 835.2240

Uracil Label in Natural Water
Dark Controls

Days posttreatment	% applied radioactivity		
	Unk 6	Average	SD
0 --		#DIV/0!	#DIV/0!
0 --			
1 --		#DIV/0!	#DIV/0!
1 --			
2 --		#DIV/0!	#DIV/0!
2 --			
4 --		#DIV/0!	#DIV/0!
4 --			
7 --		#DIV/0!	#DIV/0!
7 --			
10 --		#DIV/0!	#DIV/0!
10 --			
15 --		#DIV/0!	#DIV/0!
15 --			
21	1.36	1.36	#DIV/0!
21 --			

Data obtained from Table 17, p. 45 of the study report.

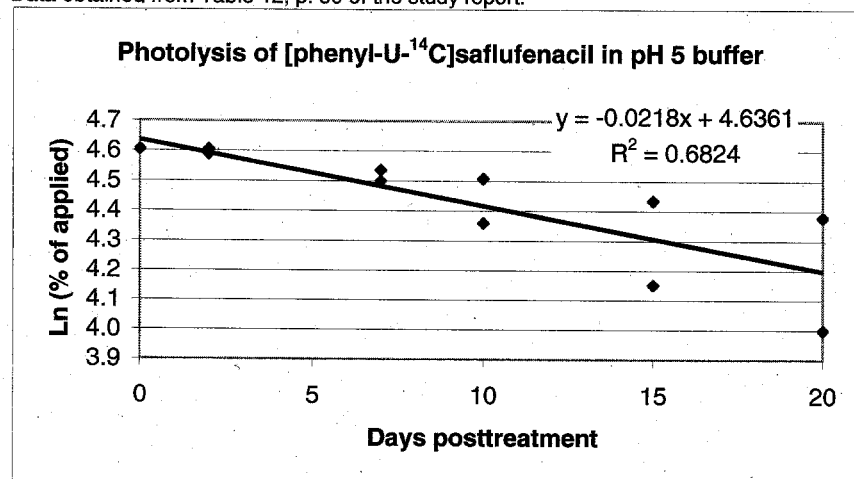
Chemical: Saflufenacil
MRID: 47127824
PC Code: 118203
Guideline: 835.2240

Phenyl Label in pH 5 Buffer
Irradiated

Half-life: 31.7 days

Days Posttreatment	Saflufenacil	
	% of applied	Ln (% of applied)
0	99.89	4.6041
0	100.00	4.6052
2	100.00	4.6052
2	98.43	4.5893
7	93.30	4.5358
7	90.00	4.4998
10	90.78	4.5084
10	78.25	4.3599
15	84.37	4.4352
15	63.53	4.1515
20	79.78	4.3793
20	54.58	3.9997

Data obtained from Table 12, p. 39 of the study report.



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.826097273
R Square	0.682436705
Adjusted R Square	0.650680376
Standard Error	0.113892176
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	0.278753199	0.278753	21.4897854	0.000928053
Residual	10	0.129714278	0.012971		
Total	11	0.408467477			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	4.636078103	0.053666298	86.38714	1.0567E-15	4.516502139	4.755654066	4.516502139	4.755654066
X Variable 1	-0.02184759	0.004712892	-4.63571	0.00092805	-0.032348566	-0.01134661	-0.03234857	-0.011346611

Chemical: Saflufenacil
MRID: 47127824
PC Code: 118203
Guideline: 835.2240

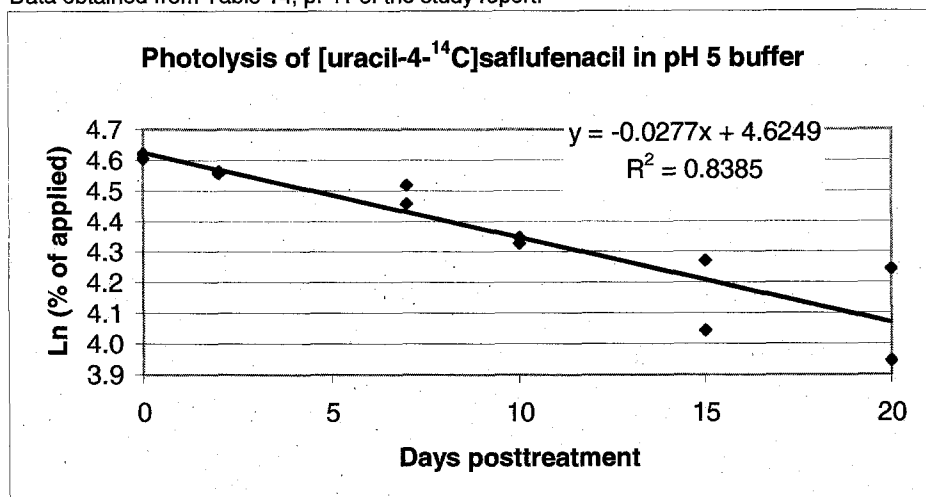
Uracil Label in pH 5 Buffer

Half-life: 25.0 days

Irradiated

Days Posttreatment	Saflufenacil	
	% of applied	Ln (% of applied)
0	100.00	4.6052
0	101.72	4.6222
2	95.87	4.5630
2	95.33	4.5573
7	86.34	4.4583
7	91.74	4.5190
10	77.30	4.3477
10	75.75	4.3274
15	71.59	4.2710
15	57.03	4.0436
20	69.70	4.2442
20	51.71	3.9457

Data obtained from Table 14, p. 41 of the study report.



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.915682646
R Square	0.838474708
Adjusted R Square	0.822322179
Standard Error	0.093001211
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	0.448979636	0.44898	51.90981	2.90942E-05
Residual	10	0.086492253	0.008649		
Total	11	0.535471889			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	4.624920309	0.04382242	105.5378	1.43E-16	4.527277873	4.72256274	4.527277873	4.722562745
X Variable 1	-0.02772726	0.003848418	-7.20485	2.91E-05	-0.036302065	-0.0191524	-0.03630206	-0.01915245

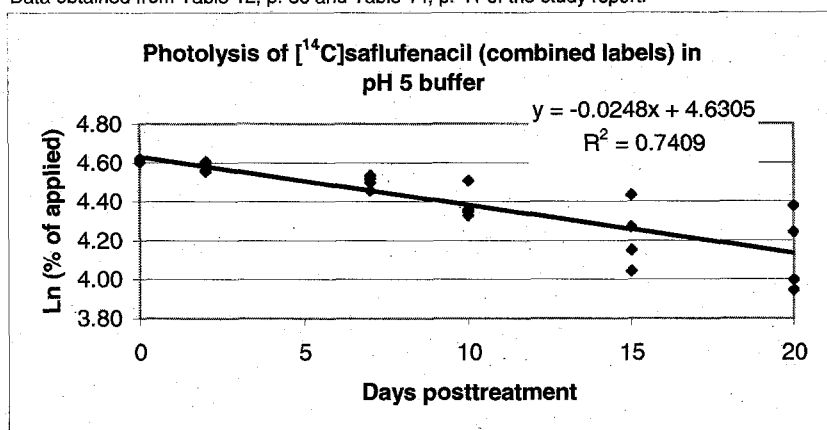
Chemical: Saflufenacil
MRID: 47127824
PC Code: 118203
Guideline: 835.2240

Combined Labels in pH 5 Buffer
Irradiated

Half-life: 28.0 days

Days Posttreatment	Saflufenacil % of applied Ln (% of applied)
0	99.89 4.6041
0	100.00 4.6052
0	100.00 4.6052
0	101.72 4.6222
2	100.00 4.6052
2	98.43 4.5893
2	95.87 4.5630
2	95.33 4.5573
7	93.30 4.5358
7	90.00 4.4998
7	86.34 4.4583
7	91.74 4.5190
10	90.78 4.5084
10	78.25 4.3599
10	77.30 4.3477
10	75.75 4.3274
15	84.37 4.4352
15	63.53 4.1515
15	71.59 4.2710
15	57.03 4.0436
20	79.78 4.3793
20	54.58 3.9997
20	69.70 4.2442
20	51.71 3.9457

Data obtained from Table 12, p. 39 and Table 14, p. 41 of the study report.



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.86076905
R Square	0.74092336
Adjusted R Square	0.72914715
Standard Error	0.10679943
Observations	24

ANOVA

	df	SS	MS	F	Significance F
Regression	1	0.71763825	0.717638	62.91696	6.7997E-08
Residual	22	0.250934599	0.011406		
Total	23	0.96857285			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	4.63049921	0.035584567	130.1266	2.95E-33	4.556701331	4.70429708	4.556701331	4.70429708
X Variable 1	-0.0247874	0.003124982	-7.93202	6.8E-08	-0.031268238	-0.01830661	-0.03126824	-0.01830661

Chemical: Saflufenacil
MRID: 47127824
PC Code: 118203
Guideline: 835.2240

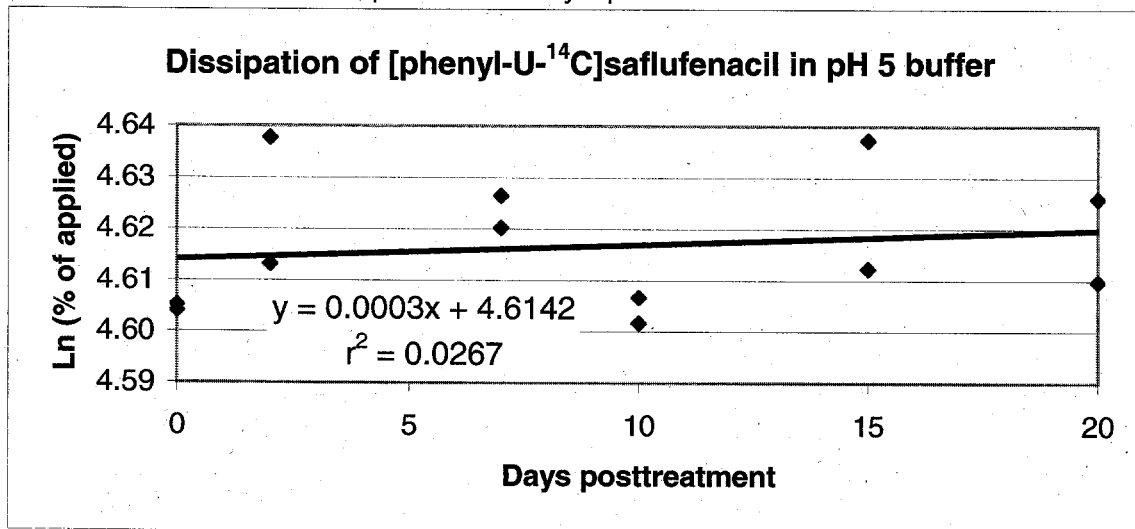
Phenyl Label in pH 5 Buffer

Half-life: Stable

Dark Control

Days	Saflufenacil	
Posttreatment	% of applied	Ln (% of applied)
0	99.89	4.6041
0	100.00	4.6052
2	100.81	4.6132
2	103.31	4.6377
7	101.52	4.6203
7	102.16	4.6265
10	100.15	4.6067
10	99.65	4.6017
15	100.72	4.6123
15	103.27	4.6373
20	102.10	4.6260
20	100.46	4.6098

Data obtained from Table 11, p. 38 of the study report.



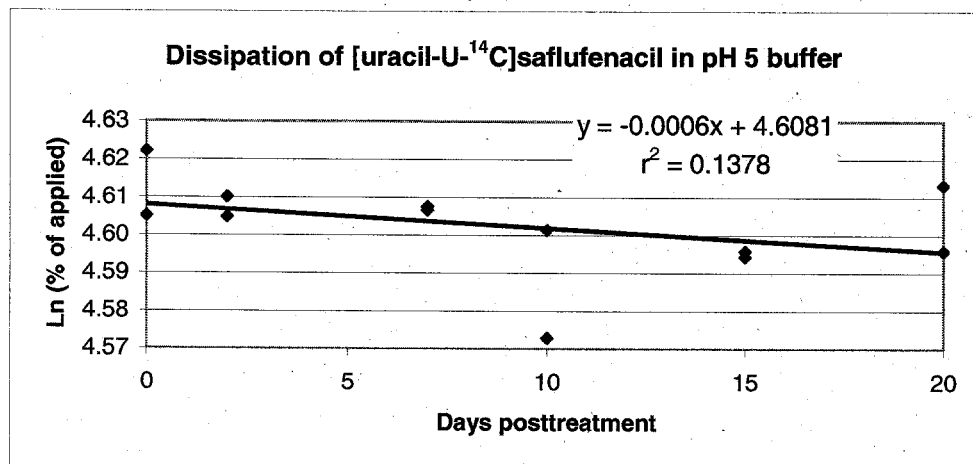
Chemical: Saflufenacil
MRID: 47127824
PC Code: 118203
Guideline: 835.2240

Uracil Label in pH 5 Buffer
Dark Control

Half-life: 1110 days

Days Posttreatment	Saflufenacil	
	% of applied	Ln (% of applied)
0	100.00	4.6052
0	101.72	4.6222
2	100.50	4.6102
2	99.97	4.6049
7	100.24	4.6076
7	100.15	4.6067
10	99.63	4.6015
10	96.82	4.5729
15	98.93	4.5944
15	99.07	4.5958
20	100.81	4.6132
20	99.07	4.5958

Data obtained from Table 13, p. 40 of the study report.



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.37121889
R Square	0.13780346
Adjusted R Square	0.05158381
Standard Error	0.01193904
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	0.000227821	0.000228	1.598284	0.234818471
Residual	10	0.001425407	0.000143		
Total	11	0.001653228			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	4.60814447	0.005625709	819.1225	1.81E-25	4.59560961	4.62067933	4.59560961	4.620679331
X Variable 1	-0.0006246	0.000494041	-1.26423	0.234818	-0.001725375	0.00047621	-0.00172537	0.000476209

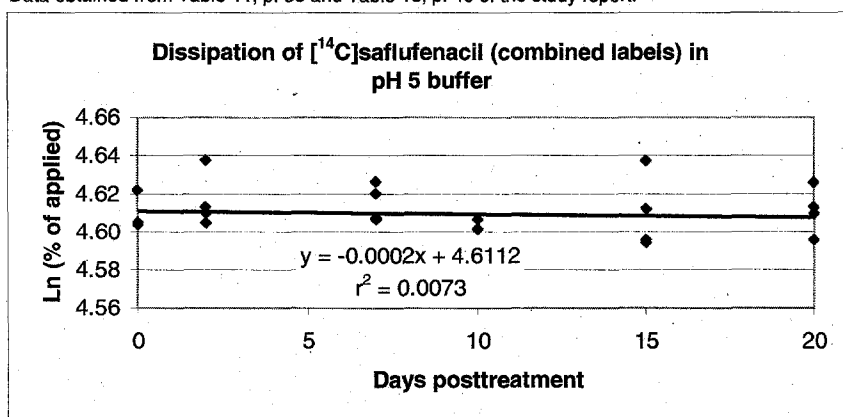
Chemical: Saflufenacil
MRID: 47127824
PC Code: 118203
Guideline: 835.2240

Combined Labels in pH 5 Buffer
Dark Controls

Half-life: 4068 days

Days Posttreatment	Saflufenacil	
	% of applied	Ln (% of applied)
0	99.89	4.6041
0	100.00	4.6052
0	100.00	4.6052
0	101.72	4.6222
2	100.81	4.6132
2	103.31	4.6377
2	100.50	4.6102
2	99.97	4.6049
7	101.52	4.6203
7	102.16	4.6265
7	100.24	4.6076
7	100.15	4.6067
10	100.15	4.6067
10	99.65	4.6017
10	99.63	4.6015
10	96.82	4.5729
15	100.72	4.6123
15	103.27	4.6373
15	98.93	4.5944
15	99.07	4.5958
20	102.10	4.6260
20	100.46	4.6098
20	100.81	4.6132
20	99.07	4.5958

Data obtained from Table 11, p. 38 and Table 13, p. 40 of the study report.



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.08560627
R Square	0.00732843
Adjusted R Square	-0.037793
Standard Error	0.01444771
Observations	24

ANOVA

	df	SS	MS	F	Significance F
Regression	1	3.39021E-05	3.39E-05	0.162416	0.690831719
Residual	22	0.004592198	0.000209		
Total	23	0.0046261			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	4.61115928	0.004813841	957.8961	2.53E-52	4.601175989	4.621142579	4.601175989	4.621142579
X Variable 1	-0.0001704	0.000422744	-0.40301	0.690832	-0.001047087	0.000706348	-0.00104709	0.000706348

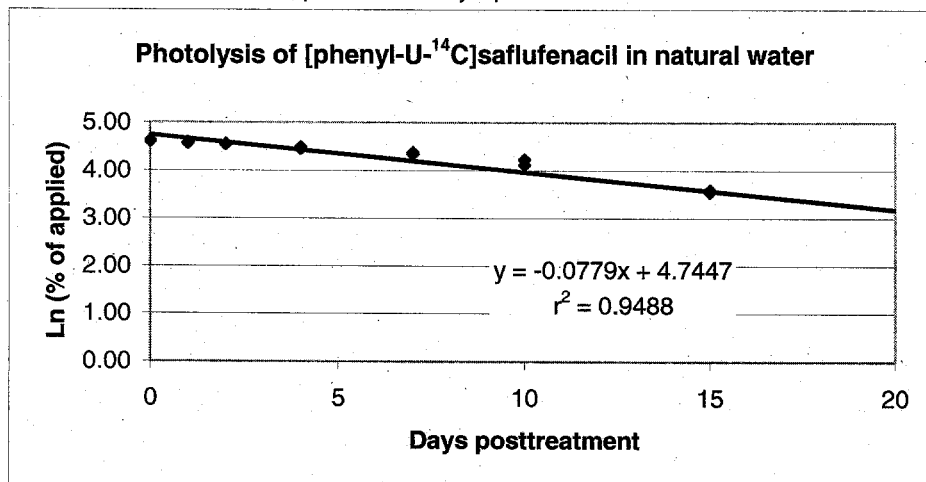
Chemical: Saflufenacil
MRID: 47127824
PC Code: 118203
Guideline: 835.2240

Phenyl Label in Natural Water
Irradiated

Half-life: 8.90 days

Days Posttreatment	Saflufenacil	
	% of applied	Ln (% of applied)
0	100.00	4.6052
0	102.26	4.6275
1	98.37	4.5887
1	96.24	4.5668
2	94.00	4.5433
2	95.20	4.5560
4	85.84	4.4525
4	89.56	4.4949
7	76.81	4.3413
7	79.51	4.3759
10	61.58	4.1203
10	68.85	4.2319
15	34.74	3.5479
15	36.55	3.5987
21	18.52	2.9189
21	20.00	2.9957

Data obtained from Table 16, p. 43 of the study report.



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.974063871
R Square	0.948800425
Adjusted R Square	0.945143312
Standard Error	0.134403139
Observations	16

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	4.686572853	4.686573	259.4398	1.97674E-10
Residual	14	0.252898855	0.018064		
Total	15	4.939471707			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	4.744708494	0.049449159	95.95125	3.9E-21	4.638650597	4.85076639	4.638650597	4.850766391
X Variable 1	-0.07791463	0.004837275	-16.1071	1.98E-10	-0.088289557	-0.0675397	-0.08828956	-0.06753971

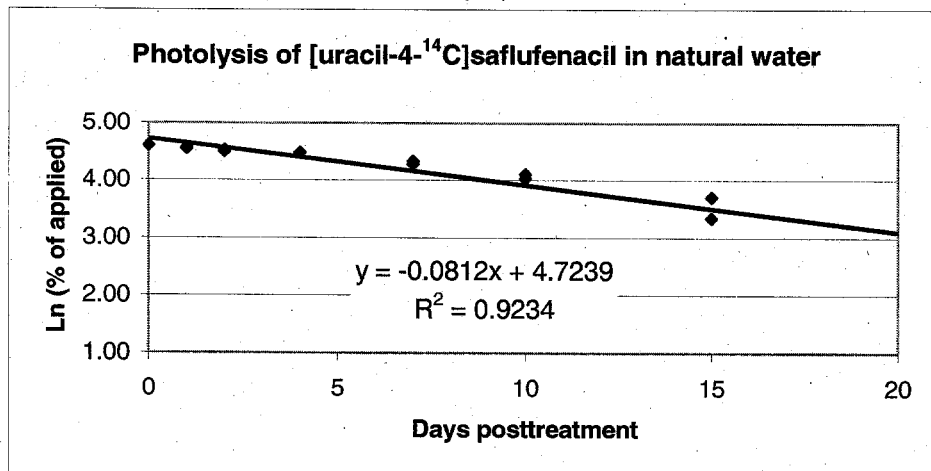
Chemical: Saflufenacil
MRID: 47127824
PC Code: 118203
Guideline: 835.2240

**Uracil Label in Natural Water
Irradiated**

Half-life: 8.54 days

Days Posttreatment	Saflufenacil	
	% of applied	Ln (% of applied)
0	100.00	4.6052
0	100.02	4.6054
1	96.34	4.5679
1	94.33	4.5468
2	89.71	4.4966
2	92.41	4.5262
4	87.64	4.4732
4	87.98	4.4771
7	76.02	4.3310
7	72.26	4.2803
10	56.01	4.0255
10	60.29	4.0992
15	28.31	3.3432
15	40.79	3.7084
21	13.40	2.5953
21	23.63	3.1625

Data obtained from Table 18, p. 46 of the study report.



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.960936586
R Square	0.923399123
Adjusted R Square	0.917927631
Standard Error	0.173576071
Observations	16

ANOVA

	df	SS	MS	F	Significance F
Regression	1	5.084677994	5.084678	168.7655	3.35615E-09
Residual	14	0.421801132	0.030129		
Total	15	5.506479126			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	4.723909377	0.063861534	73.97112	1.48E-19	4.586940009	4.8608787	4.586940009	4.860878745
X Variable 1	-0.08115646	0.006247139	-12.991	3.36E-09	-0.094555238	-0.0677577	-0.09455524	-0.06775768

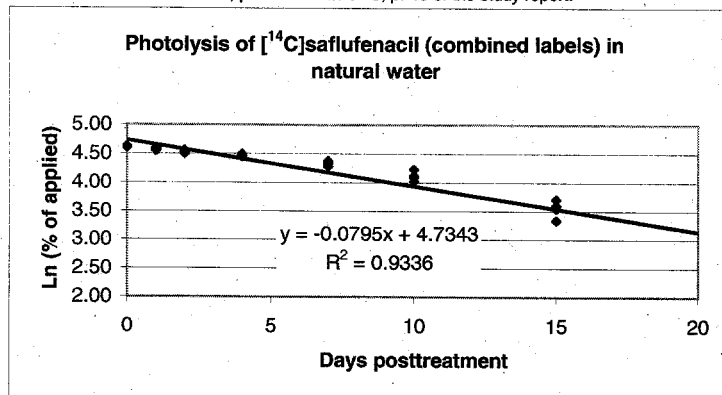
Chemical: Saflufenacil
MRID: 47127824
PC Code: 118203
Guideline: 835.2240

Combined Labels in Natural Water
Irradiated

Half-life: 8.71 days

Days Posttreatment	Saflufenacil	
	% of applied	Ln (% of applied)
0	100.00	4.6052
0	102.26	4.6275
0	100.00	4.6052
0	100.02	4.6054
1	98.37	4.5887
1	96.24	4.5668
1	96.34	4.5679
1	94.33	4.5468
2	94.00	4.5433
2	95.20	4.5560
2	89.71	4.4966
2	92.41	4.5262
4	85.84	4.4525
4	89.56	4.4949
4	87.64	4.4732
4	87.98	4.4771
7	76.81	4.3413
7	79.51	4.3759
7	76.02	4.3310
7	72.26	4.2803
10	61.58	4.1203
10	68.85	4.2319
10	56.01	4.0255
10	60.29	4.0992
15	34.74	3.5479
15	36.55	3.5987
15	28.31	3.3432
15	40.79	3.7084
21	18.52	2.9189
21	20.00	2.9957
21	13.40	2.5953
21	23.63	3.1625

Data obtained from Table 16, p. 43 and Table 18, p. 46 of the study report.



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.96621269
R Square	0.93356696
Adjusted R Square	0.93135252
Standard Error	0.15221015
Observations	32

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	9.767194213	9.767194	421.5825	3.23214E-19
Residual	30	0.695037927	0.023168		
Total	31	10.46223214			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	4.73430894	0.039598444	119.558	9.46E-42	4.653438124	4.8151797	4.65343812	4.81517975
X Variable 1	-0.07953555	0.003873646	-20.5325	3.23E-19	-0.087446587	-0.0716245	-0.08744659	-0.0716245

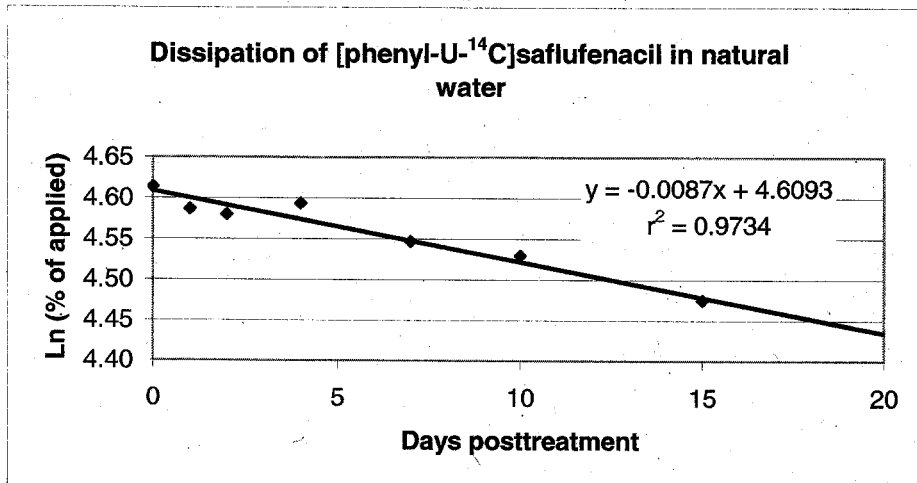
Chemical: Saflufenacil
MRID: 47127824
PC Code: 118203
Guideline: 835.2240

Phenyl Label in Natural Water
Dark Control

Half-life: 79.4 days

Days Posttreatment	Saflufenacil % of applied	Ln (% of applied)
0	100.91	4.6142
1	98.20	4.5870
2	97.54	4.5803
4	98.88	4.5939
7	94.40	4.5475
10	92.73	4.5297
15	87.79	4.4749
21	83.35	4.4230

Data obtained from Table 15, p. 42 of the study report.



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.986611368
R Square	0.973401991
Adjusted R Square	0.968968989
Standard Error	0.011570858
Observations	8

ANOVA

	df	SS	MS	F	Significance F
Regression	1	0.02939852	0.029399	219.5808	5.93988E-06
Residual	6	0.000803309	0.000134		
Total	7	0.030201828			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	4.609282383	0.006020465	765.6024	3.35E-16	4.594550836	4.62401393	4.594550836	4.624013931
X Variable 1	-0.00872708	0.000588941	-14.8183	5.94E-06	-0.01016817	-0.007286	-0.01016817	-0.007285995

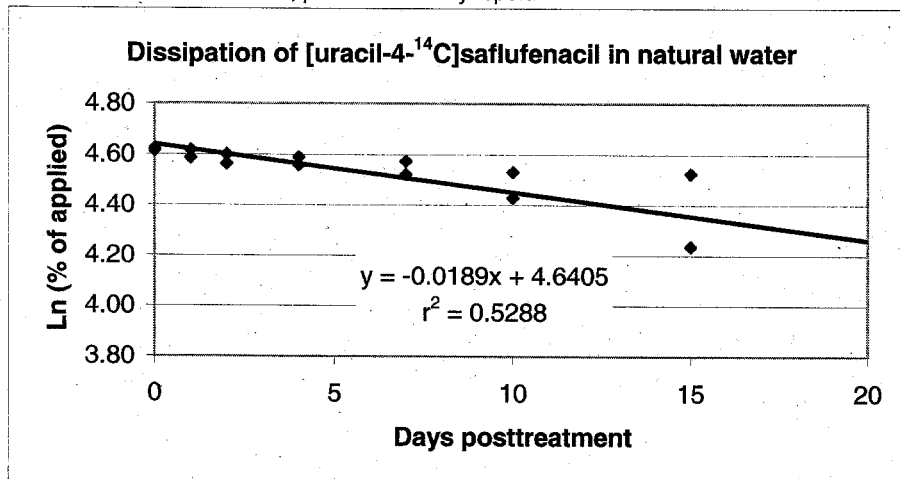
Chemical: Saflufenacil
MRID: 47127824
PC Code: 118203
Guideline: 835.2240

Uracil Label in Natural Water
Dark Control

Half-life: 36.6 days

Days Posttreatment	Saflufenacil	
	% of applied	Ln (% of applied)
0	101.02	4.6153
0	101.85	4.6235
1	98.23	4.5873
1	101.29	4.6180
2	96.06	4.5650
2	99.55	4.6007
4	95.38	4.5579
4	98.45	4.5895
7	92.08	4.5227
7	96.95	4.5742
10	83.88	4.4294
10	92.96	4.5322
15	69.21	4.2371
15	92.31	4.5252
21	49.13	3.8945
21	90.19	4.5019

Data obtained from Table 17, p. 45 of the study report.



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.727178515
R Square	0.528788592
Adjusted R Square	0.495130634
Standard Error	0.132830195
Observations	16

ANOVA

	df	SS	MS	F	Significance F
Regression	1	0.277196623	0.277197	15.71066	0.001413306
Residual	14	0.247014048	0.017644		
Total	15	0.524210671			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	4.640508783	0.048870446	94.95532	4.51E-21	4.535692101	4.74532546	4.535692101	4.745325465
X Variable 1	-0.01894896	0.004780663	-3.96367	0.001413	-0.02920246	-0.0086955	-0.02920246	-0.00869545

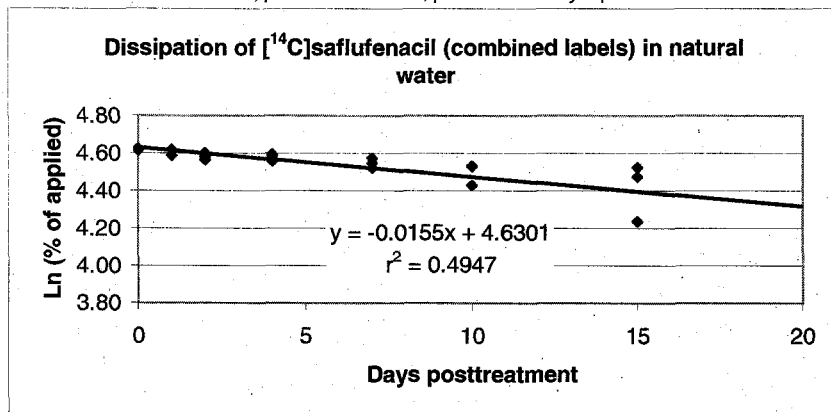
Chemical: Saflufenacil
MRID: 47127824
PC Code: 118203
Guideline: 835.2240

Combined Labels in Natural Water
Dark Controls

Half-life: 44.6 days

Days Posttreatment	Saflufenacil	
	% of applied	Ln (% of applied)
0	100.91	4.6142
0	101.02	4.6153
0	101.85	4.6235
1	98.20	4.5870
1	98.23	4.5873
1	101.29	4.6180
2	97.54	4.5803
2	96.06	4.5650
2	99.55	4.6007
4	98.88	4.5939
4	95.38	4.5579
4	98.45	4.5895
7	94.40	4.5475
7	92.08	4.5227
7	96.95	4.5742
10	92.73	4.5297
10	83.88	4.4294
10	92.96	4.5322
15	87.79	4.4749
15	69.21	4.2371
15	92.31	4.5252
21	83.35	4.4230
21	49.13	3.8945
21	90.19	4.5019

Data obtained from Table 15, p. 42 and Table 17, p. 45 of the study report.



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.703339288
R Square	0.494686154
Adjusted R Square	0.471717343
Standard Error	0.113960993
Observations	24

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	0.279707225	0.279707	21.5373	0.000126139
Residual	22	0.285716373	0.012987		
Total	23	0.565423598			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	4.630099983	0.034234193	135.2478	1.26E-33	4.559102613	4.7010974	4.55910261	4.70109735
X Variable 1	-0.01554167	0.003348898	-4.64083	0.000126	-0.022486855	-0.0085965	-0.02248686	-0.00859648

Attachment 3: Transformation Pathway Presented by Registrant
Illustration of Test System
Comparison of Artificial Light to Natural Sunlight

Figure 27 Proposed Photolysis Degradation Pathway of BAS 800 H Under Aqueous Photolytic Conditions.

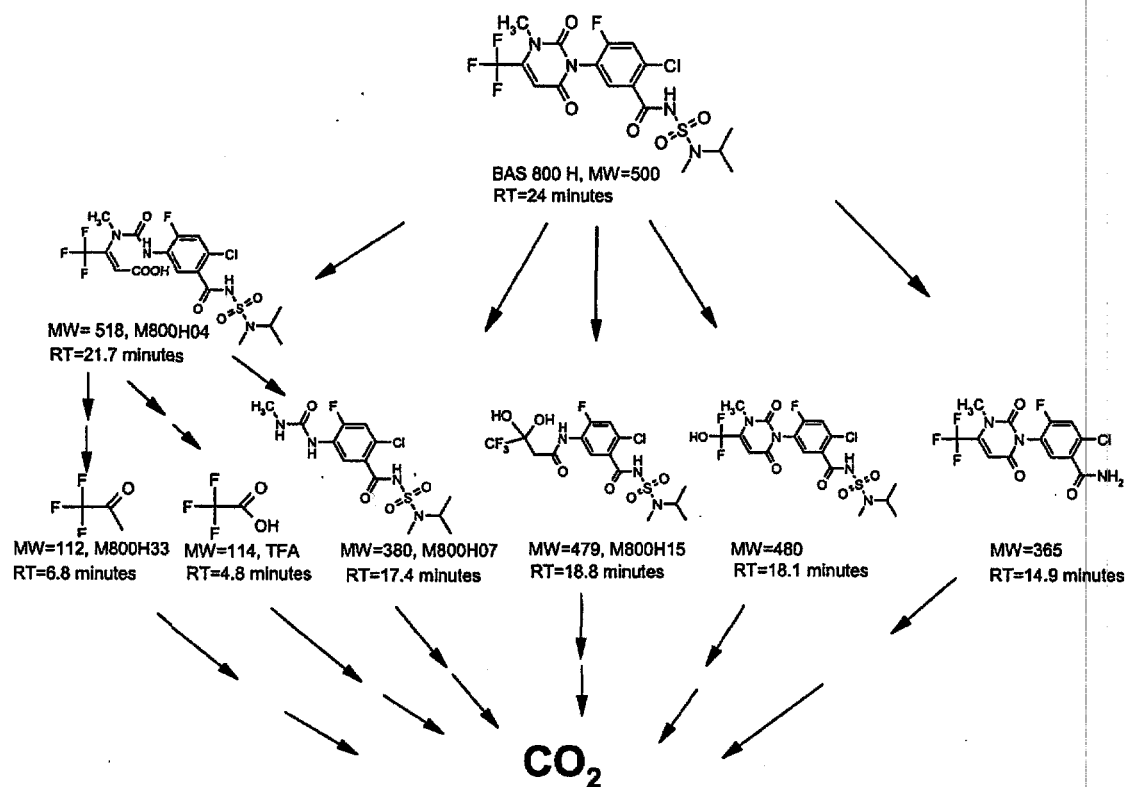


Figure 4. Diagram of the Photolysis Setup.

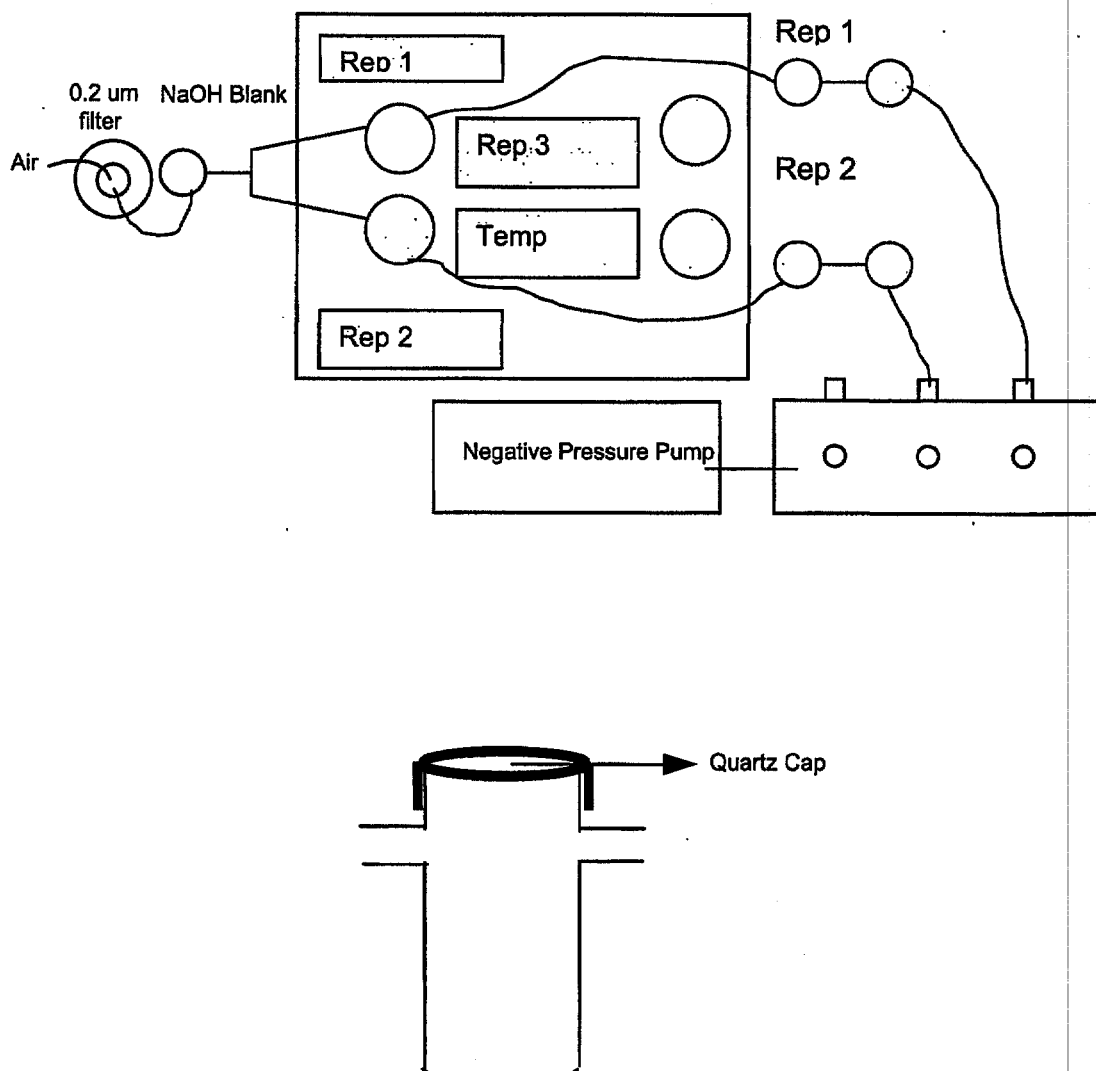


Figure 2. Comparison of Xenon Lamp Intensity to the Natural Sunlight Intensity at 40° N Latitude; pH 5 Buffer.

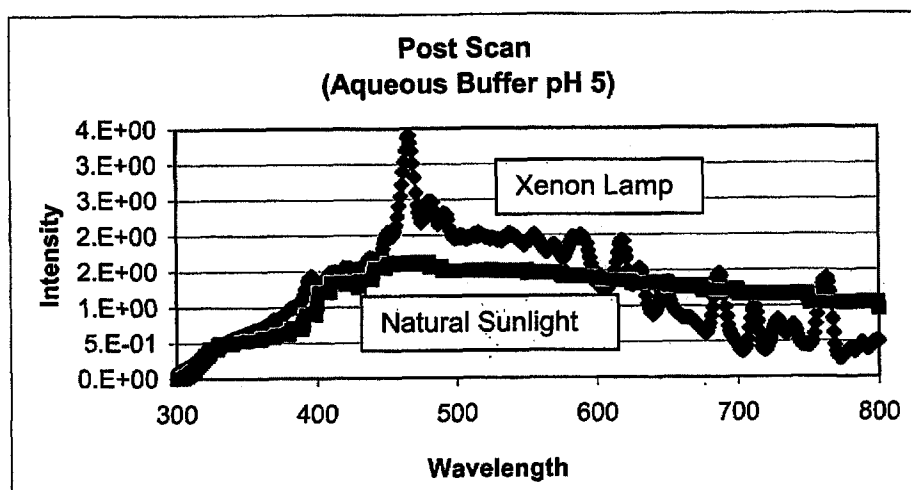
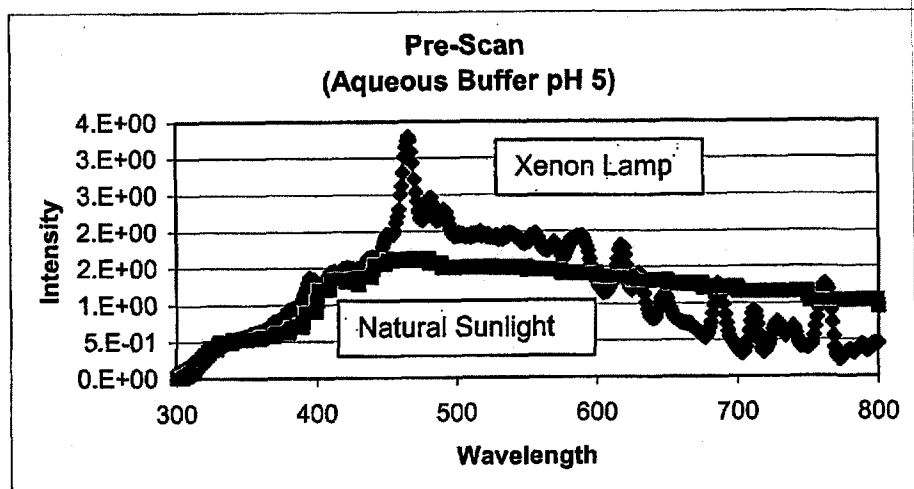


Figure 3. Comparison of Xenon Lamp Intensity to the Natural Sunlight Intensity at 40° N Latitude (Natural Water).

